

19 SEP 160
Monthly

A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A. H. HITCHCOCK
1220-1235 Caxton Building
Chicago

RELIANCE

**For the man who
wants better motors**

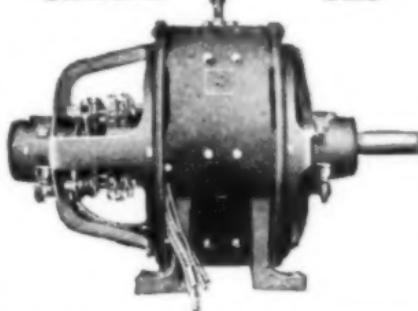
Before designing Type T Motors we went to men who knew motors from A to Z. Thirty-five prominent electrical engineers in the large steel mills and machine shops pointed out the weak spots in motors of every type and make as revealed in their repair shops. The ideas of these thoroughly practical men were then built into Type T Reliance Motors.

That a motor built on this plan would satisfy the man who wanted better motors has already been demonstrated by actual service.

Bulletin 2014 tells the whole story.

**Reliance Electric &
Engineering Company**

1050 Ivanhoe Road
Cleveland Ohio

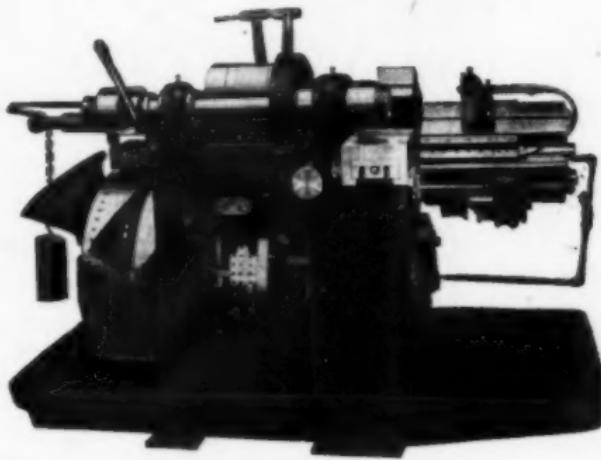






GRIDLEYS

"STAND UP"



They STAND UP—

- to Accuracy**
- to Production**
- to Long Wear**

Single Spindle—Capacities 2½ to 5 inches

THE NATIONAL ACME CO.

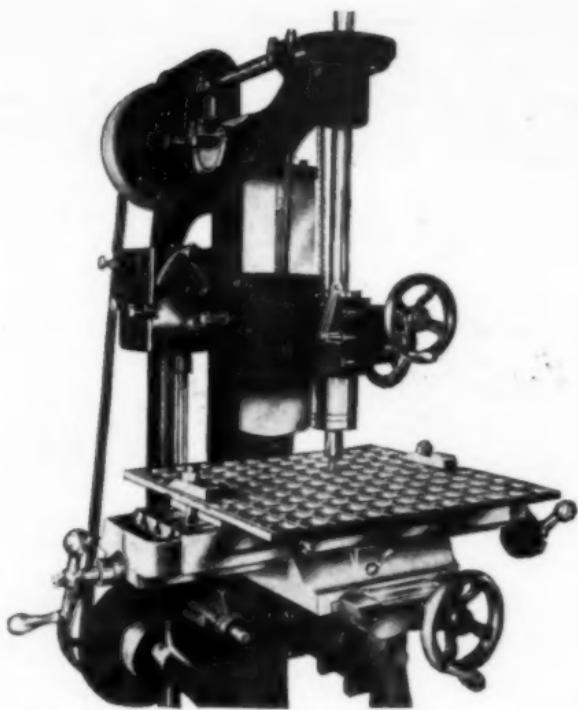
GENERAL OFFICES
CLEVELAND, O.

Windsor, Vt. CANADIAN SCREW PLANT
MONTREAL, P. Q.

Branch Offices:

NEW YORK BOSTON CHICAGO DETROIT ATLANTA SAN FRANCISCO
WAREHOUSES—NEW YORK, CHICAGO With FOREIGN REPRESENTATIVES

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Thread Dies and Screw Machine Products at Cleveland, Ohio



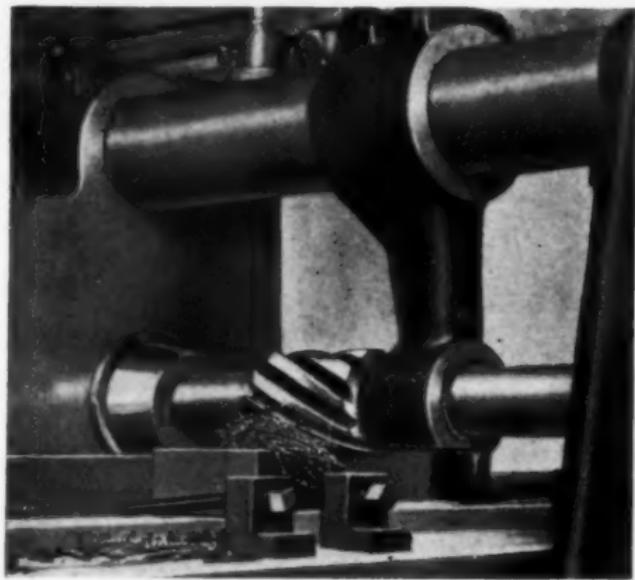
The best way meant to use a Knight

The hard, unusual jobs are often excessively expensive unless you have a Knight Milling and Drilling Machine in your shop to take care of them.

A Brockton, Mass., firm had a difficult piece of milling to do (the mould shown above), and thought they were up against it, until it was put on a Knight—and their worries faded away. It enables you to mill, bore or drill at any angle with only one setting of the job, and invariably reduces machining time and shop costs.

Keep up with the procession by sending for full information. Three sizes to choose from

W. B. Knight Machinery Co.
3920 W. Pine St., St Louis, Mo.



Results

Results show the quality of cutters. On work demanding heavy cuts and fast speeds

Brown & Sharpe Milling Cutters

prove themselves worthy of their reputation for quality and service. The thought behind each cutter is more production and less grinding. This basis has been the satisfying feature that has appealed to manufacturers for over 50 years and is still helping concerns desiring satisfactory results.

*Results tell more than words
Send for catalog 28-S—then decide for yourself*

Brown & Sharpe Mfg. Co.
Providence, R. I., U. S. A.

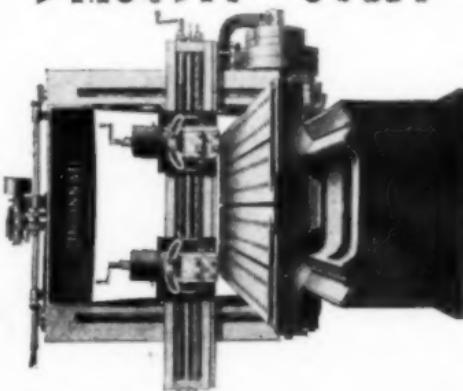
Record-Making Planers and Boring Mills

They are Making Daily Records of Larger Output and Lower Costs

Cincinnati Planers.

Variable speeds, rapid operation and great rigidity combine to put Cincinnati Planers in the lead as great producers.

Our Patent Tu-Speed Planers and Cincinnati Motor-Driven Planers, the latter with 10 cutting speeds, are both made in many sizes and types for cutting costs on any kind of metal planing.



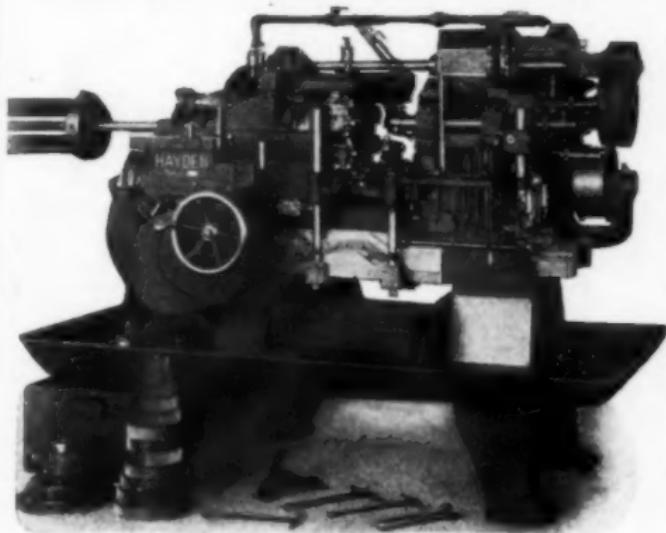
Boring Mills

Cincinnati Rapid Production Boring Mills are made in both the spur gear and bevel gear types. Their great convenience facilitates rapid operation. The right feed and speed for the work are instantly available.

Information gladly furnished

THE CINCINNATI PLANER CO., Cincinnati, Ohio, U. S. A.

The Cincinnati Automatic Five-Spindle Screw Machine



The actual time per piece is only $2\frac{1}{2}$ to 36 seconds, according to the character of the work.

In order to accomplish that result, we have built into the Cincinnati Automatic 48 features of distinctive merit, which means an improvement in about every important factor in screw machine construction.

*The Catalog explains fully
Will you write for a copy?*

Cincinnati Automatic Machine Co.
Oakley, Cincinnati, Ohio

G-K Betterments

And What They Mean to Lathe Users



G-K 14", 16" and 18"
Heavy Quick Change

We have a book called "G-K Betterments."

It describes at some detail, in an interesting manner, the "better way" of constructing lathes, as applied to the G-K Line of Engine Lathes, from 14" to 30" inclusive.

If you are a lathe user you will find it an interesting, instructive and profitable book to read.

*Write for a copy of "G-K Betterments"
We shall be very glad to send it*

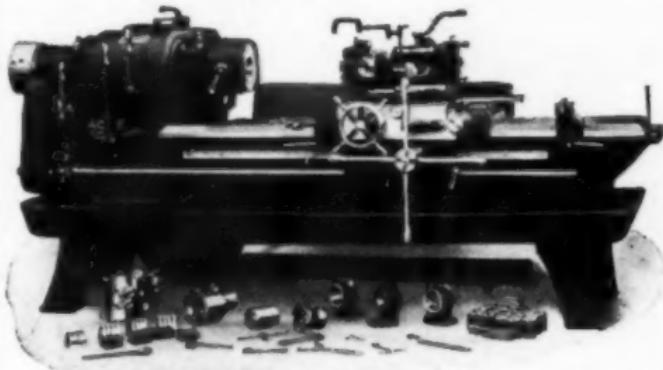
The Greaves-Klusman Tool Co.
Cincinnati, Ohio, U. S. A.

CINCINNATI-ACME

**3 $\frac{1}{4}$ "x36" Bar Cap.
36" Chucking Cap.**

Flat Turret Lathe

The most rigid Flat Turret Lathe made, of exceptional adaptability to a wide range of both bar and chucking work, and of great productive capacity.



3 $\frac{1}{4}$ "x36" Cincinnati-Acme equipped for bar work

In many a plant the Cincinnati-Acme has solved the problem of the quantity production of detail parts at a satisfactory cost.

Its wide range of usefulness on both bar and chucking work may adapt it to some of **your** manufacturing problems, to your saving, satisfaction and profit.

No harm in discussing it with us. We  may be able to save you a great deal of money; and if it is not adapted to the economical production of your work, we will frankly say so. Will you write?

The Acme Machine Tool Co.
Cincinnati, Ohio, U. S. A.

Reliable Punches and Dies

For All Makes of Machines



The Lewthwaite kind are made for strenuous service, and guaranteed to make good.

We invite you to send us a trial order, and to use that punch or die on the most difficult job in your shop. We want to add you to our list of thoroughly satisfied customers.

Sheet Iron Shear and Rod Cutter

This
ient and
find it just
your shop, for it
easily shearing and
cutting even beyond its
rated capacity. It will earn
its cost in a comparatively
short time.

handy tool is compact, conven-
easy to operate. You will
right for many jobs in
has power to do



*Our Catalog of Iron-Workers' Tools tells about our Shearing,
Cutting and Punching Machines, Power and Foot Presses,
Benders, Punches and Dies. Send for your copy today.*

George A. Lewthwaite Co.
116 Walker St., - - - New York

Universal Angle Plate

For Machining at Any Desired Angle
On Any Type of Machine Tool



8" x 10" Worm Adjusting—Made in Four Sizes

Absolute rigidity and non-liability to movement under strain of cut. Work table does not overhang point of attachment to the base; consequently, no support or blocking is required to prevent the movement of table under any stress.

It moves through a complete circle horizontally and 90° vertically, and has a vernier attachment reading to 5' for especially accurate work.

It will convert your plain miller or grinder into a universal machine, and wherever used it saves time and money far beyond its reasonable cost, and insures a high degree of accuracy.

May we send complete data and prices?

Boston Scale & Machine Co.
100 Ruggles Street, Roxbury, Mass.

Always Paying Dividends
The "Handiest Racks"



They just can't help it. They save so much time in handling pipe, bars, shafting and the like, so many cuss words, so much space, so much waste and damage that they even earn money while you sleep.

Everybody uses them who knows how good they are. You will if you will let us put you wise as to their actual merits. Merely press the button with a letter or a post card, and see things begin to happen.

Do it today

Wm. S. Yohe Supply Co.
503 Mahoning Road, N. E., Canton, Ohio

It Pays for Itself

In Time Saved, in Convenience
and in Economy



OWAY

Adjustable Support for Stock

adjusts instantly to height, is easily shifted from one machine to another, and handles anything in long stock that requires support in feeding. The two styles we make fill your needs. They cost so little and are so handy and satisfactory that you will be glad to have them in your plant.

Round base \$15.00; square base \$17.50 f.o.b. Hartford

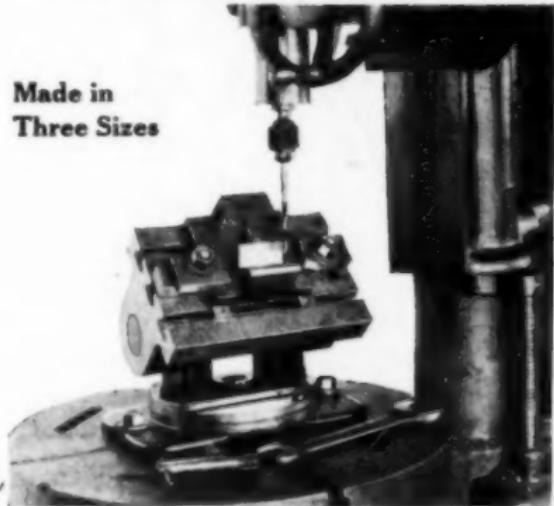
We solicit your orders for immediate shipment

A. F. WAY CO., Inc., - Hartford, Conn.

Quick, Accurate Set-Ups

With the Reid Universal Angle Fixture

Made in
Three Sizes



IN THESE DAYS of high priced labor every shop is in urgent need of real labor-saving devices. The Reid Universal Fixture does away with the woeful waste of time and the unsuccessful results of haphazard set-ups. The adjustments are such as to eliminate all possible chance of error, even in the hands of an inferior workman.

It helps you to drill, mill, plane, shape and grind accurately. Invaluable for die sinking, tool and experimental work. The design eliminates all overhang. It swivels 360 degrees horizontally, and 180 degrees vertically, which facilitates settings of compound angles. Extreme accuracy is instantly available.

Investigate the possibilities for economy with this fixture. Your inquiry involves no obligation.

Reid Bros. Co., Inc., Beverly, Mass.



A
**Manufactured
Sand Blast
Abrasive**

Flows so freely because of its smooth, hard, pearl-like granules, that smaller nozzles may be used than with natural sand.

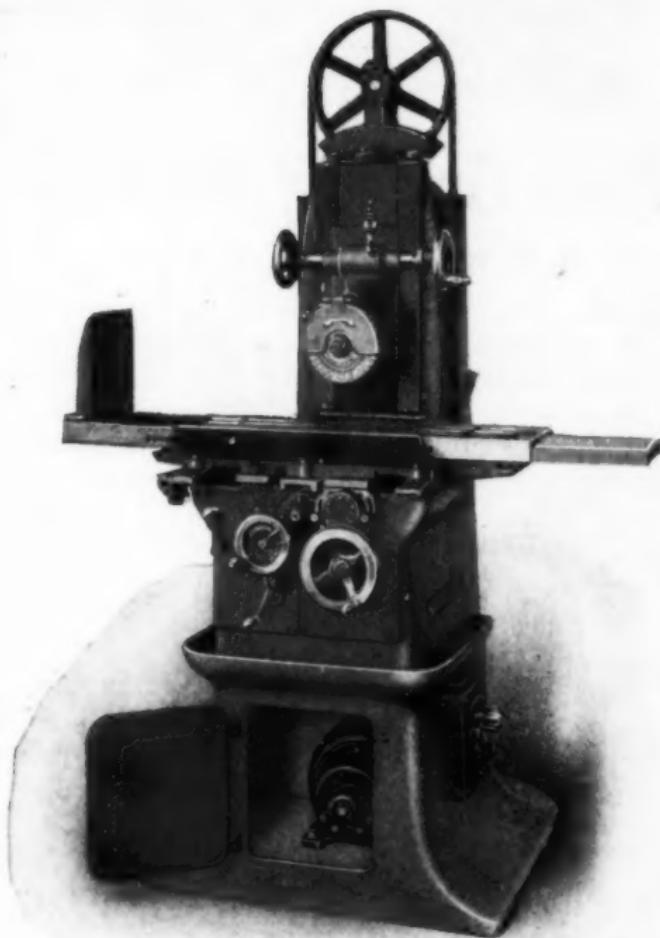
This *reduces air consumption* to a marked degree—often 50%.

Air, labor, freight, storage-space, handling-cost, and dust-disposal costs are also reduced because *Flint Shot* works faster and lasts longer than natural sand—so much so that one car of *Flint Shot* does the work of several cars of natural sand.

Need we say more?

We will gladly sell you a ton or two at the car-lot price for test purposes.

United States Silica Company
1941 Peoples Gas Bldg., Chicago, Ill.



The Abrasive Surface Grinder

This modern machine is a big step forward in the designing of tool-room surface grinders. It is more rigid and 50% heavier than any other machine of its type. The one-piece frame, resting on three points, insures permanent accuracy of alignment. It is a big producer, convenient and safe.

Write for full description of this great machine

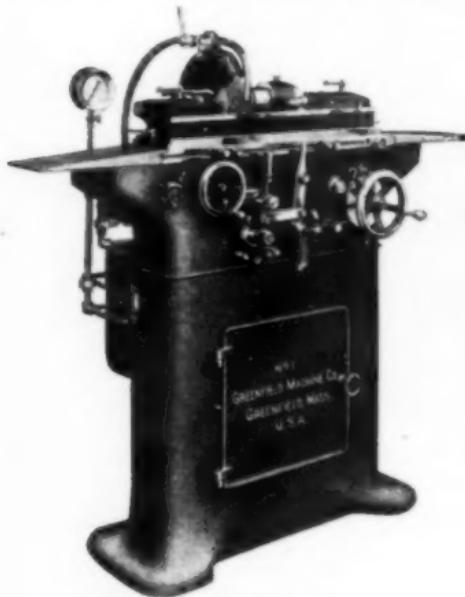
Abrasive Machine Tool Co.
East Providence, R. I.

Greenfield

Plain Grinding Machine

A Wonder on Small Work

It costs^sa great deal less than the larger grinders, and it equals, at least, their production of small cylindrical parts. The Hydraulic Table Feed, which is as simple as it is effective, permits two to three times the table speeds that are possible with other feeds, and that without jar or strain.



Within the
reach of
every shop
and good
enough for
the best

Write for folder and mail sketches or samples of small parts

Greenfield Machine Company
Greenfield, Mass. U. S. A.

W & M No. 1 Universal Grinder



A Perfect Tool Room Machine.

Centers swing 10" diameter 30" long.

Circular on request

**Wilmarth & Morman Co.
Master Grinder Makers
1185 Monroe Ave., N. W., Grand Rapids, Mich., U.S.A.**

Better Compression—Less Leakage

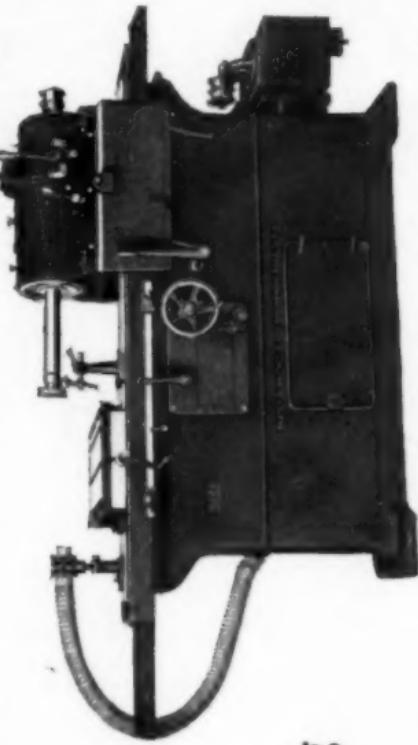
by finishing
Aeroplane and
Automobile
Engine Cylinders
on a

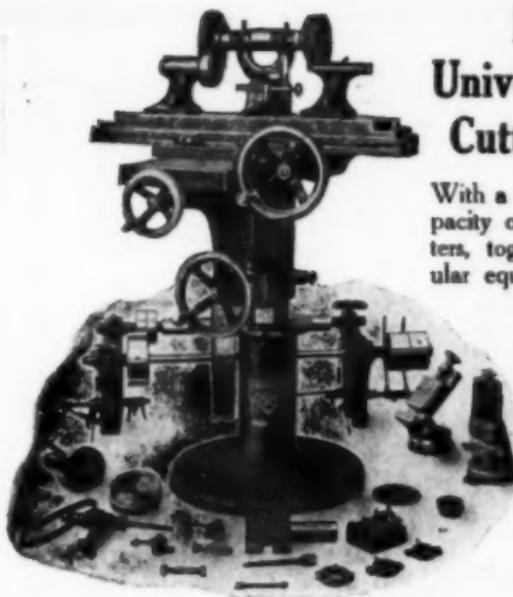
WHITNEY Cylinder Grinding Machine

Write for Catalogue

Grinds holes from 3-in. to 7-in. diameter.
Equipped for wet or dry grinding as desired.

BAXTER D. WHITNEY & SON, Inc., Winchendon, Mass., U.S.A.





Premier Universal Tool and Cutter Grinder

With a swing of 8" and capacity of 15" between centers, together with the regular equipment furnished, it will grind almost any cutter or other tool used in a modern tool room. Workmanship, material and design of the highest quality.

*Write for descriptive
Circular*

Immediate Delivery

Simmons 10" Universal Index Centers



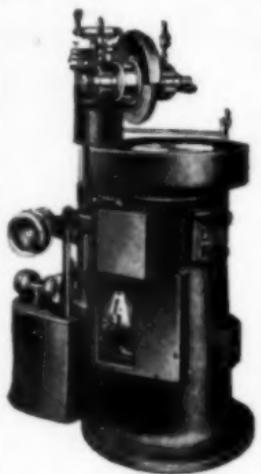
Manufactured with the idea of supplying the market with a device in which accuracy, durability and simplicity are the main issues and in which no one feature is sacrificed for another.

The price is the lowest consistent in keeping with the above standards. Our production is such that immediate delivery can be made.

You need one? Order now!

Simmons Machine Co., Inc., Albany, N.Y.

New York, 1001 Singer Bldg. Detroit, 804 Dime Savings Bank Bldg.
Buffalo, 358 Ellicott Square



Curved Surfaces Ground Accurately

You can grind either convex or concave surfaces, as well as flat work, to within .0004" of manufacturing accuracy with the

12" Bristol Rotary Precision Grinder

of the swivel back type. We also furnish this highly efficient machine in the straight back type for flat surfaces only. Its rotary action insures continuous grinding—no lost motion.

*The free Bulletin describes
the construction in detail*

**Bristol Machine Tool Co., Bristol, Conn.
Successors to The C. G. Garrigus Machine Co.**

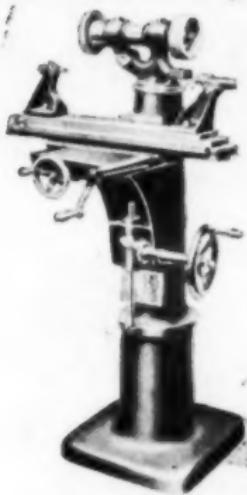


STERLING

**The Ideal
Universal
Tool Grinder
for
Accuracy
Speed
and
Rigidity**

*A post card brings our
new, illustrated catalog*

**McDONOUGH MFG. COMPANY, Machine Tool
Department
Eau Claire, Wisconsin**



Why Pay More?

Before investing in a new grinder it will pay you to become thoroughly acquainted with the possibilities offered in the improved "Wells" No. 190 Grinder—a reasonably priced machine whose performance duplicates that of the more expensive grinders.

Most of the leading Machine Tool Dealers throughout the United States carry

"Wells" No. 190 Grinders



in stock. They will be glad to show you just where this machine will save you money.



Machine Tool Catalog No. 39-H describes this and other G.T.D. Machines in detail. Ask the nearest dealer for a copy—or write direct to

Machine Tool Division

Greenfield Tap and Die Corporation

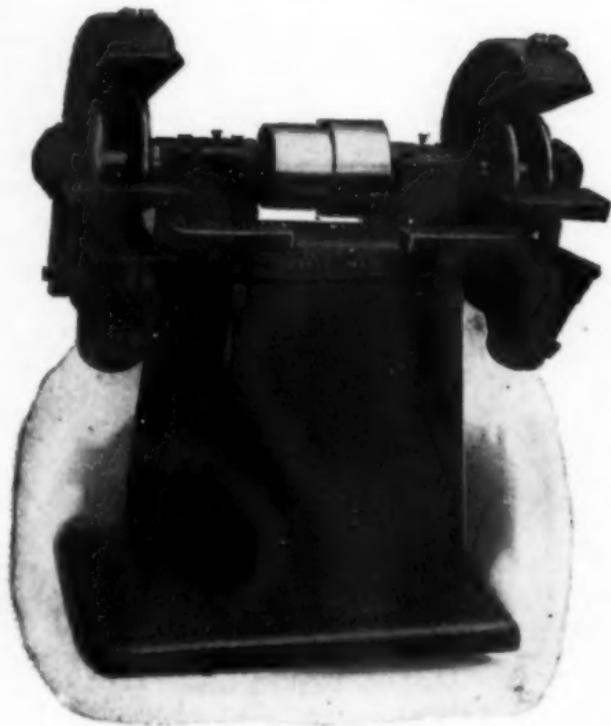


Greenfield,
Massachusetts,
U. S. A.



Grind it

on a “Blount”



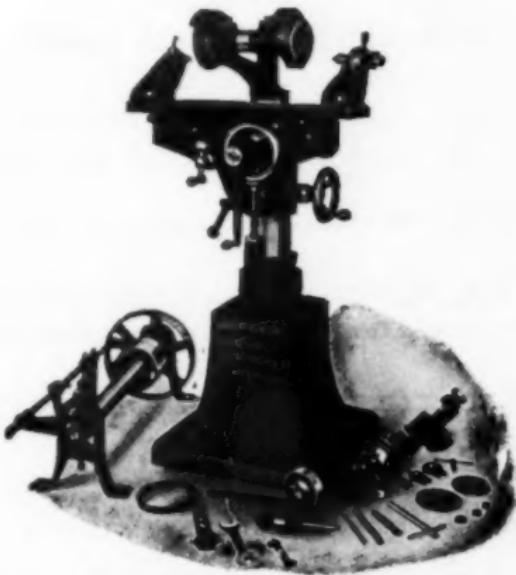
No. 6½

Our eight sizes meet all requirements of general grinding work. The large bearings insure accurate work under continuous heavy load.

J. G. BLOUNT CO., Everett, Mass.

Grand Rapids No. 1

Universal Cutter, Reamer
and Tool Grinder



Simple in Design
Efficient in Service
Accurate in Workmanship
Economical in Cost

Ask for bulletin giving full particulars

Grand Rapids Grinding Machine Co.

17 Ottawa Ave., N. W.
Grand Rapids, Michigan, U. S. A.

Ott Grinders

Combine the essentials of
ACCURACY and RIGIDITY
with SIMPLICITY of design

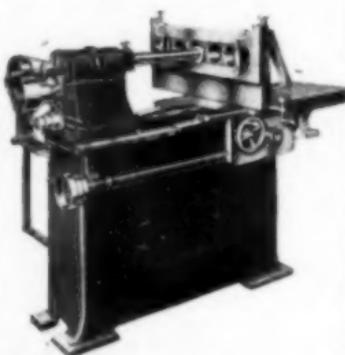
Simplicity accounts for their price, and for
their popularity among good operators.

5"x18" Plain — 10"x32" Universal — 6"x6" Internal

Ott Grinder Company

200 West Tenth St., Indianapolis, Ind.

For Internal Grinding— The Schmidt



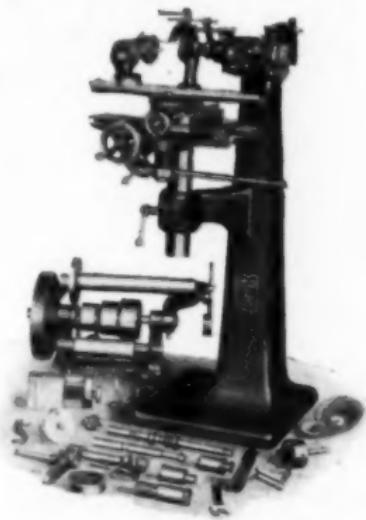
Both Quick and Accurate

For regrinding tractor, truck and auto engine cylinders it is unsurpassed, and for any internal grinding its easy manipulation, and the certainty and exactness of its results make it an especially useful machine in plants where such work must be done rapidly and correctly. Doing work quickly and well, it cannot help lowering costs.

Write for description. Prompt deliveries

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.

**Makes cutter and tool sharpening
so easy that you cannot help
saving time and money**



The Thompson Universal Cutter and Tool Grinder

is a modern tool of superior design and refinement of construction. It is equally well adapted for cylindrical, surface and internal grinding. Our Bulletin No. C-3 contains excellent illustrations, showing use of machine on spiral and side cutters, inserted tooth face mill, small end mill, large and small saws, gear and formed cutters, tap, counterbore, reamer, etc.

*Your foremen will be interested in looking over
these 24 practical pointers—they are
yours for a postal*

**The Thompson Grinder Co.
Springfield, Ohio**

For Grinding Castings

A Time and Money Saver



You will find a hundred uses for a Stow Flexible Shaft, and for every one it will save something in time or cost. Isn't it worth investigating? Write us.

Stow Flexible Shaft Company
26th & Callowhill Sts., Philadelphia, Pa.

Partridge Combination Grinding and Polishing Lathe

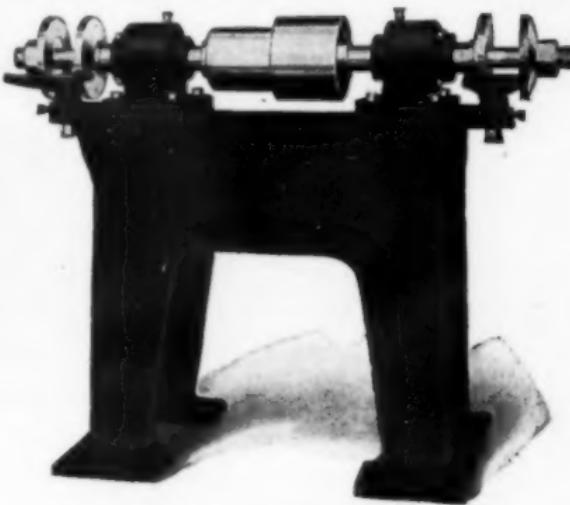
 With Ring Oiling Bearings

Practically indispensable for garages, tire repair shops, electro-platers, small machine shops, etc.

Write for Circulars

E. O. Partridge
2041-49 W. Lake St., Chicago

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels,



BALL BEARING GRINDER

5 Sizes for Wheels, 8"x1" to 30"x4"

Aside from the very great advantage of ball bearings over any other type in the matter of power consumption, there is the further material advantage of greater longevity, as well as a considerable saving in lubricant, ball bearing machines requiring lubrication only every few months.

Bearings employed are of highest grade American make—double row combined radial and thrust type, and fully guaranteed by both the manufacturers and ourselves.

*For Complete Specifications and Description,
Ask for Bulletins 8 & 9*

The Webster & Perks Tool Co.
Box 1340, Springfield, Ohio, U. S. A.



AN appreciation of its construction plus a knowledge of its past performance have created this unlimited confidence in the DUMORE Grinder.

Accuracy in grinding is possible only with a tool that is mechanically right. The DUMORE, with its dynamically balanced armature and speeds ranging from 10,000 to 50,000 R. P. M. positively insures perfect work, free from chatter-marks, taper or bell mouth. It is light and portable and is the ideal tool for grinding those "hard-to-get-at" jobs.

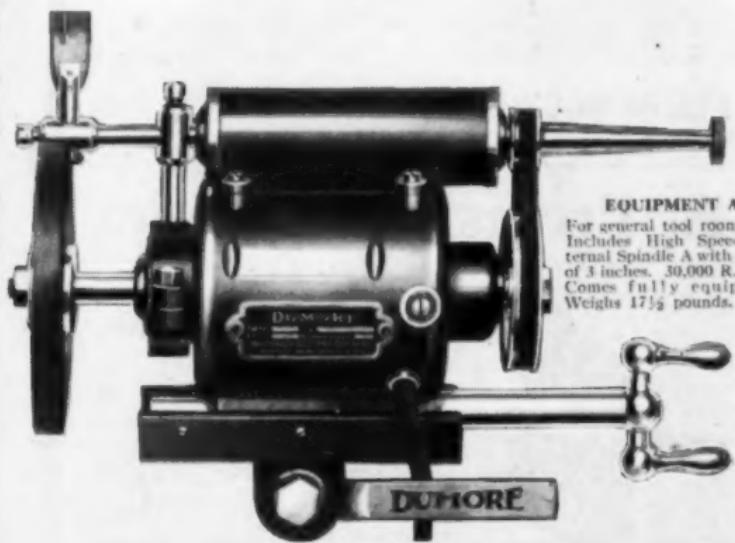
Vitally affecting the very volume of your production—in fact, back of the reputation of your manufactured products—is the quality of the tools you employ.

Is your tool-room equal to its task?

WISCONSIN ELECTRIC CO.
4311 Sixteenth St., RACINE, WIS.

DUMORE

"There's only one way under the sun for us to do this job right—that's with a DUMORE Grinder"



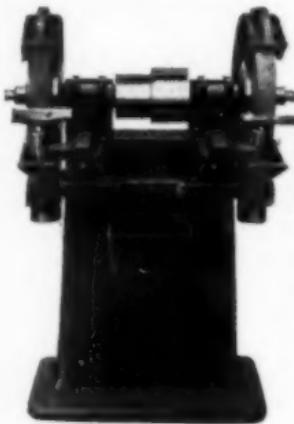
EQUIPMENT A

For general tool room use. Includes High Speed Internal Spindle A with reach of 3 inches. 30,000 R.P.M. Comes fully equipped. Weighs 17½ pounds.

HIGH SPEED

GRINDERS

Maximum Grinder Service



Imperial Gives It

Because of its design, which provides both weight and strength; and

Because of its construction, which exemplifies the best modern machine tool practice—long bearings, graphite lined, wick oiling, heavy spindle. Nothing left out or skimped; it is a real machine from floor to guard.

*Sizes 6 to 18 inches
Let us describe more fully*

CLIZBE BROS. MFG. CO., Plymouth, Ind.

A Precision Grinder Of Speed and Reliability

The Manhattan



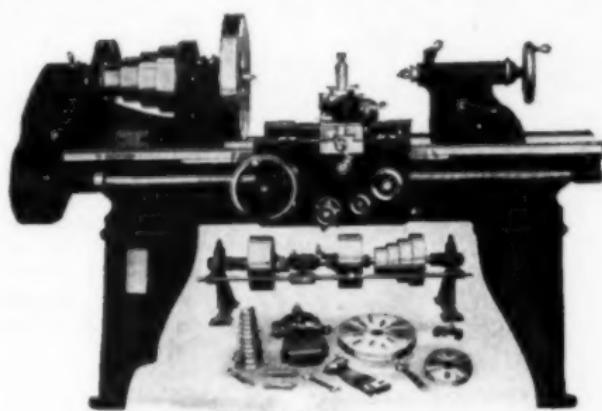
It resembles other grinders only in details that could not be improved; it differs from them in every point where better design or construction proved practicable.

Hence it is in a class by itself in respect to its strength, its convenience in operating facilities, its peculiar freedom from vibration, and its ability to do heavy work without loss of accuracy. Investigation will show its distinctive merit.

Full description for the asking

**Manhattan Machine & Tool Works
Dept. A., Grand Rapids, Mich.**

South Bend Lathe



South Bend Lathes are made in six sizes—13", 15", 16", 18", 21" and 24" swing, with beds from 4' to 16' in length. Furnished with either straight or gap bed.

South Bend Lathes have been on the market thirteen years. Over 20,000 in use. Dealers in every large city.

Reasonable Price Lathes

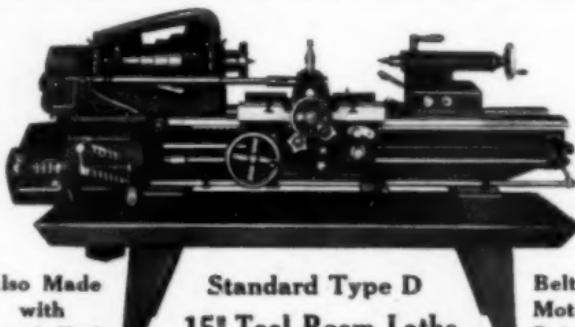
"How To Run A Lathe"—An 80 page book postpaid to any address for 10 cents, silver or stamps accepted.

Send for free Catalog illustrating and describing entire line

South Bend Lathe Works

Established 1906 South Bend, Ind. 430 E. Madison

Crawford Lathes



Also Made
with
Geared Head

Standard Type D
15" Tool Room Lathe

Belt or
Motor
Drive

Made for a discriminating trade and to give satisfaction under the most exacting conditions.

Crawford Machine Tool Co., Inc.
21 Park Row, New York

Sidney 15", 17" and 19" Lathes

Are Tools of Unfailing Dependability



S. or D. B. G.; Plain or Q. C. G.; Beds from 6' Up

The picture shows our 19"x12' three-step cone, double back gear, quick change gear Engine Lathe, with cabinet leg under long bed and center support leg. All Sidney Lathes combine the high productive capacity required in manufacturing with tool-room accuracy. Write for specifications of these all-around dependable lathes.

THE SIDNEY TOOL CO., SIDNEY, OHIO

Worcester

Lathes Always Means Lathe

Quality



11°, with Compound Rest and Power Cross Feed

It requires no stretch of the imagination to say that Worcester Lathes are about as nearly perfect as they can be made with the present-day knowledge of mechanics.

We specialize on 12" and 14" sizes, each of them both simple and singularly complete in its design. When you get a "Worcester" you get it all—no extra attachments to be bought later.

Our production enables us to offer Worcester Lathes at a very reasonable price for what they will do.

Shall we send you the Bulletin?

Worcester Lathe Company
68 Prescott St., Worcester, Mass.

Monarch Lathes

give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes**. Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

*Sold by a leading Machinery Dealer
In every machinery center.*



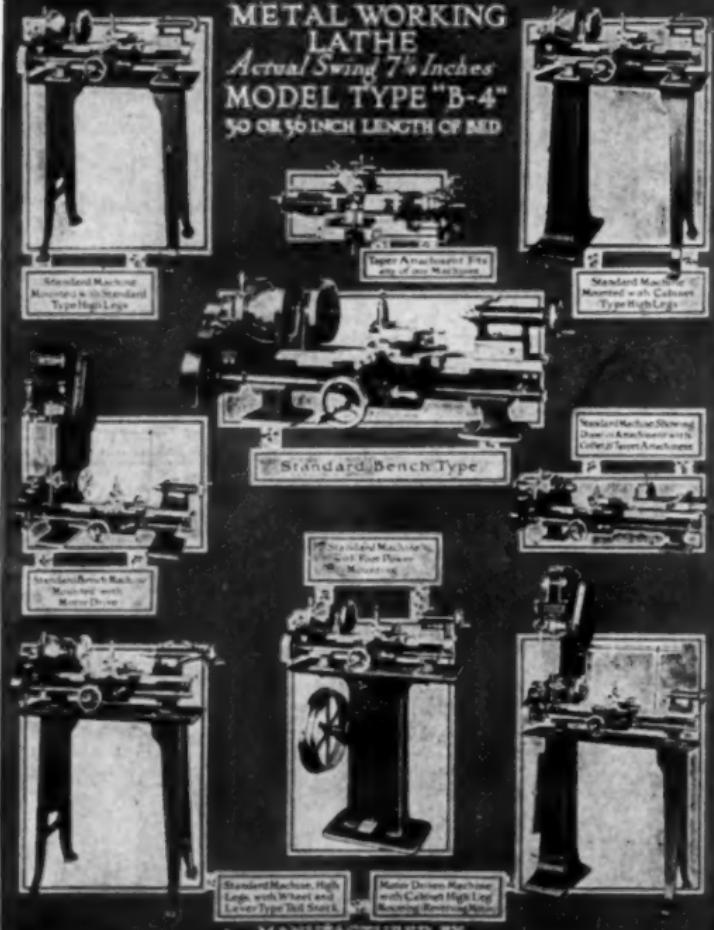
The Monarch Machine Tool Co., Sidney, Ohio

"THE SMALL LATHE FOR THE BIG JOB"

"DALTON SIX"

METAL WORKING
LATHE

Actual Swing 7½ Inches
MODEL TYPE "B-4"
50 OR 56 INCH LENGTH OF BED

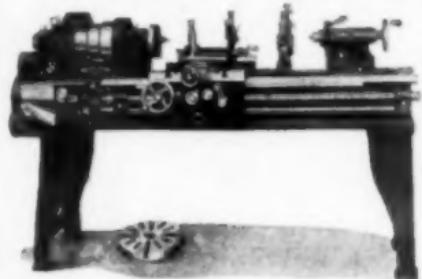


MANUFACTURED BY
DALTON MANUFACTURING CORPORATION
NEW YORK U.S.A. CABLE ADDRESS "ALEDAL" NEW YORK

COMPLETE BULLETINS SENT ON REQUEST

"Filsmith" High Power Lathe

For the Severest Service



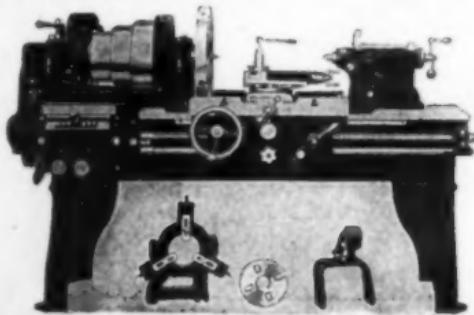
14" and 16" Swing
3-Step Cone
Double Back Gear
Q. C. Gear Box
Any Length Bed

It has great power for its rated swing, is simply designed and ruggedly constructed, with special features of its own which add to its convenience and output. Write for description and specifications—glad to send them.

PHILIP SMITH MFG. CO., SIDNEY, O.

The 18" Heavy Duty Mueller Lathe

Is a Machine That Is Worthy of Investigation



Write for further particulars, and let us convince you of the worth of this Lathe

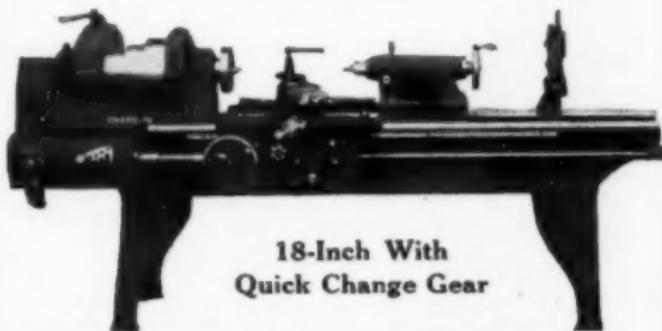
THE MUELLER MACHINE TOOL CO., Cincinnati, O.

Radial Drills and Lathes

Established 1902

Put Us to the Test

As to "Chard" Super-Quality



18-Inch With
Quick Change Gear

Built with 16", 18", 20", 24" and 28" Swing

First, we most cordially invite you to send for the Catalog and look it over. You will sense at once that our experience of over 35 years in lathe building has resulted in some very superior lathe construction, part by part, and in the "Chard" as a whole.

We suggest the Catalog first because we do not believe you can read the description of the building of the "Chard" without wanting to know more about it in a practical way, in which event we shall be very glad to have you put us to the test. We will back the "Chard" Lathe to the limit.

Will you drop a line for the Catalog today?

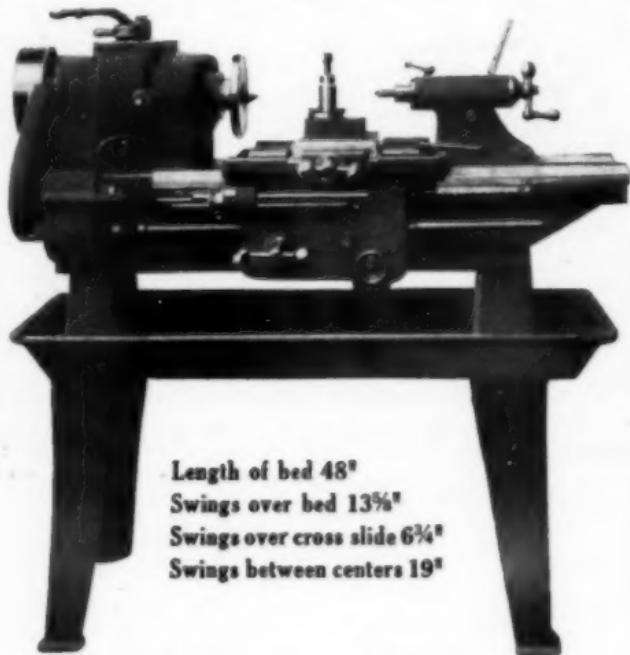
Chard Lathe Company

Newcastle, Ind.

DOMESTIC DISTRIBUTORS

THE F.O. STALLMAN SUPPLY CO., San Francisco, Cal.
VONNEGUT MACHINERY CO., Indianapolis, Ind.
ENGLISH & MILLER MACHINERY CO., Detroit, Mich.
OGDEN R. ADAMS, Rochester, N. Y.
THE W. M. PATTISON SUPPLY CO., Cleveland, Ohio.
J.S. MILLER MACHINERY CO., Pittsburgh, Pa.
MONARCH MACHINERY CO., Philadelphia, Pa.
DALE-BREWSTER CO., Chicago and New York.

For Quantity Production Of Short Duplicate Parts



Length of bed 48"
Swings over bed 13 $\frac{1}{2}$ "
Swings over cross slide 6 $\frac{3}{4}$ "
Swings between centers 19"

The Adams Short-Cut Lathe

This simply designed, ruggedly built lathe is equipped for flexibility and ease of operation and a maximum output. Absolutely high-grade construction throughout insures a smooth action and permanent accuracy. The tailstock can be brought right up to the headstock for extremely short work.

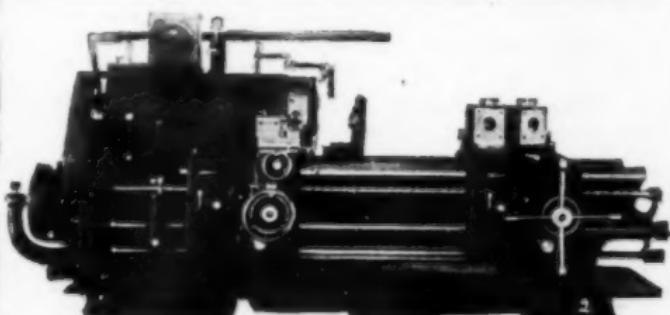
The complete description will make you think still better of it

O. R. Adams Manufacturing Co., Inc.
Rochester, N. Y.

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



Steinle 24" Full Swing Side Carriage Turret Lathe

Machine is regularly furnished belt driven or arranged for motor drive.

Actual swing over ways.....	24"
Swing over side carriage.....	21"
Diameter of hole through spindle.....	4" or 6 1/4"
Traverse of side carriage and of turret carriage.....	56"

Both carriages have independent quick change feed and independent power traverse all controlled from carriage aprons.

Side carriage can be run past the chuck and is equipped with cross slide having power cross feed and with turret tool block having four tool holders.

There are thirty reversible spindle speeds available. One belt or one motor furnishes power for all functions of the machine.

Turret is massive and designed particularly with a view to rigid support of tool equipment.

Send us drawings of gas engine fly wheels, cylinders where cast singly, pistons, and piston rings. Let us give you production estimates and the cost of tool equipment for these and other pieces and also let us tell you the time required to change the tool settings for the different pieces.

Numerous repeat orders received from many of the principal manufacturers of tractors, trucks, aviation motors, marine gas engines, and stationary engines demonstrate the satisfactory results obtained from the use of our machines.

More Cuts per Blade

When buying hack saw blades you are interested in the number of cuts you can get from each blade—you are interested in the cost per cut, not the cost per blade.

TUNGSTEN STEEL Liberty HACK SAW BLADES

That is why Liberty hack saw blades are preferable—you get more cuts per blade—each cut costs you less.

Whatever your cutting problems are, Liberty hack saw blades are the solution. Made from the finest raw material and carefully constructed, each blade represents the greatest number of cuts obtainable.

Write for catalog and prices

Sterling Products Co., Inc.
549 Washington Blvd., Chicago, Ill.

Draw-in and Thrust Chucks

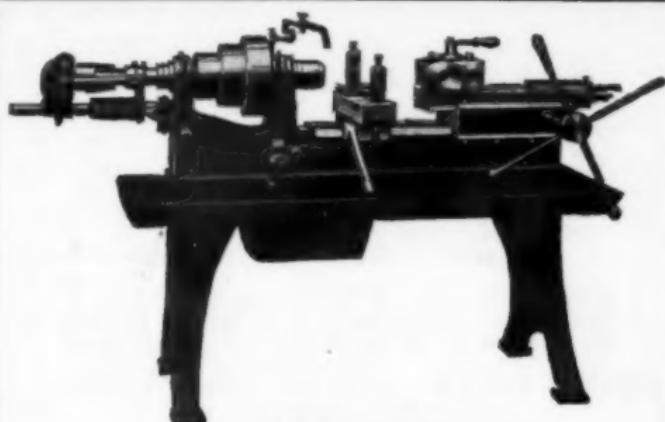
for Tool Room Lathes and Screw Machines. Look for the name "Hardinge Brothers" and write us. And did you ever ask us to make those—

Screw Machine Collets

with regular or irregular holes? We are prepared to make good deliveries. Why not try us next time? Quantities never too small or too large to interest us.

When making inquiry, kindly refer to "Chuck Department"

Hardinge Brothers, Inc.
Chicago, Ill.



MODEL "D"

Turret Lathes and Screw Machines

Now Ready for Delivery

Designed for Rapid Manufacturing of
Parts Requiring Several Operations

MADE IN FOUR SIZES:

No. 2 $\left\{ \begin{array}{l} 1\frac{1}{16}^{\prime \prime} \text{ Wire Feed Capacity, Plain Head} \\ 1\frac{1}{32}^{\prime \prime} \text{ Hole Through Spindle.} \end{array} \right.$

No. 3 $\left\{ \begin{array}{l} 1\frac{1}{16}^{\prime \prime} \text{ Wire Feed Capacity, Plain Head} \\ 1\frac{1}{32}^{\prime \prime} \text{ Hole Through Spindle.} \end{array} \right.$

No. 4 $\left\{ \begin{array}{l} 1\frac{1}{8}^{\prime \prime} \text{ Wire Feed Capacity, Geared Head} \\ 2\frac{1}{32}^{\prime \prime} \text{ Hole Through Spindle.} \end{array} \right.$

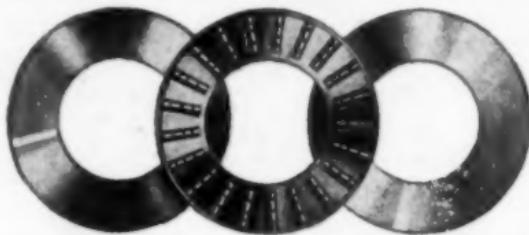
No. 5 $\left\{ \begin{array}{l} 1\frac{1}{8}^{\prime \prime} \text{ Wire Feed Capacity, Geared Head} \\ 2\frac{1}{32}^{\prime \prime} \text{ Hole Through Spindle.} \end{array} \right.$

With or Without Power Feed to Turret Slide.
Mechanically Perfect and Fully Guaranteed.

Manufactured By

Smurr & Kamen Company

328-330 N. Albany Ave., Chicago, Ill.



BEARINGS

LIGHT DUTY

HEAVY DUTY

ALL TYPES
MANY SIZES IN STOCK

THE GWILLIAM COMPANY
ENGINEERS

253 WEST 58th ST., (at Broadway), NEW YORK

Branch, 1314 Arch St., Philadelphia

Abbott Steel Bearing Balls

High Grade—Highly Finished



We shall be glad to have your inquiries and make estimates

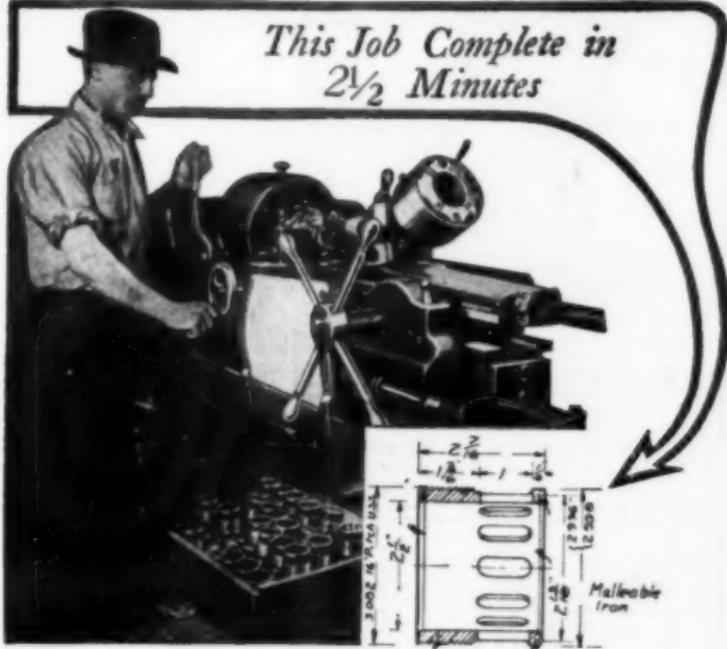
The Abbott Ball Company
Elmwood District, Hartford, Conn.



THE TILTED TURRET

A CLEAR TRACK THE STOCK.

*This Job Complete in
2½ Minutes*



The TILTED TURRET MACHINES

are accurate and productive.
Fifteen years' of thoroughly
tested service. A size for
every class of manufacturing.

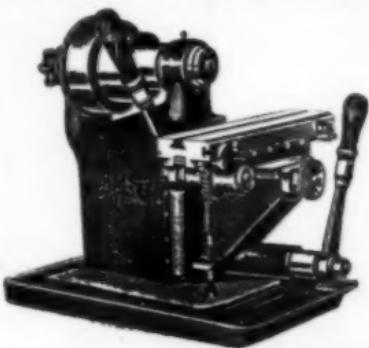
Ask the User

Catalog "H"—It's Free

WOOD TURRET MACHINE CO.

BRAZIL, INDIANA, U.S.A.

Just The Machine

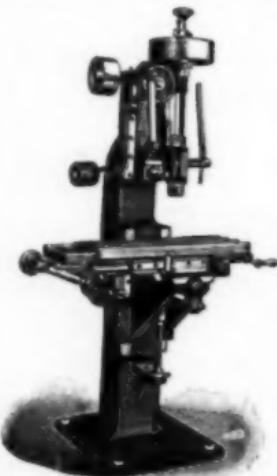


for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

**The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.**

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.



Clough No. 2 Vertical Miller With Slotting Attachment

Size of table 28" x 9 $\frac{3}{4}$ "
Lengthways auto feed 21"
Cross motion 9"
Vertical adjustment.... 15"

A rapid, accurate, convenient machine, which covers a wide range of milling and slotting within its capacity.

The Slotting Attachment is strongly bolted to the machine. It has a 12" slide and 4 $\frac{3}{8}$ " stroke. Tilts either side to 5 degrees.

It may be just what you need; ask for folder

R. M. CLOUGH, Meriden, Conn.

Stronger Than Solid Tools

And Replaces Hundreds of Them
Accurate—Efficient—Economical



The Genesee Adjustable Hollow Mill

Is accurate. Adjusts to the 1,000th of an inch, and can not change in size as a solid tool will do after a few grindings.

Is efficient. Cuts 12⁸ to 15⁸ a minute in steel.

Is economical. One set of blades outlasts three to five solid tools, and are replaced at small cost. Only seven sizes cover all requirements from $\frac{1}{4}^{\prime\prime}$ to $2^{\prime\prime}$.

Is better in every way. Saves time and money and increases production.

Every shop should have a set of these powerfully-built adjustable hollow mills, to cover present work and provide for emergencies.

Write for description and price-list

Genesee Manufacturing Co.
Rochester, N. Y.



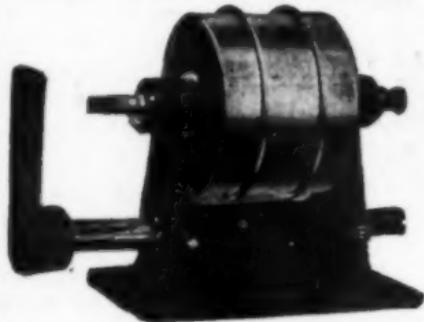
Burke Quality Excels on Fine Points

Machines of
Burke Quality
are never built
with any name
cast on the
frame but our
own—

**BURKE
CONNEAUT
U. S. A.**

For Sale Everywhere

This Tapping Machine Now Has Greater Capacity



Burke's
No. "D" Taps
 $\frac{5}{8}$ " Holes
in
Horseshoe
Steel

BUILT throughout with exceptional care, our several sizes give service in proportion. Accurate, rapid and convenient, they give solid satisfaction. No. "D" sells for \$60.

Send for details today

The Burke Machine Tool Co., Conneaut,
Ohio

"Whitney" Hand Miller

THOUSANDS IN USE



Specially handy for the Tool Room. A wide variety of cuts can be quickly set up and completed without any sacrifice of the accuracy so essential in Tool Room work.

Prompt Deliveries

But they are going fast. Don't wait! Send your order in at once.

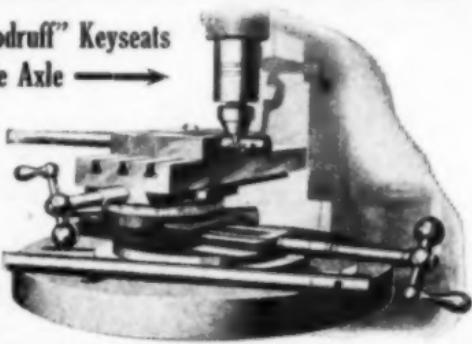
The Whitney Mfg. Co., - Hartford, Conn.

Chains—Keys—Hand Milling Machines

Mills On Any Drill Press

Cutting "Woodruff" Keyseats
In Automobile Axle →

For the
Garage
Diemaker
Repair Shop
Patternumaker



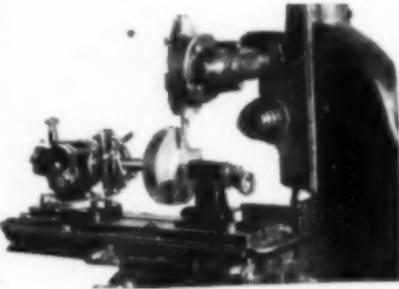
The Davis Milling Attachment and Compound Table can be used on any drill press from 14 to 42-in. swing. It is equally valuable in big and small shops, as it does most of the lighter jobs as well as a large, expensive machine; cuts all kinds of keyseats perfectly. Our cylinder reamers for reborning the Ford car, and our efficient air compressor are also attractively priced. Send for circulars.

Hinckley Machine Works, HINCKLEY,
ILL.

The Whiting & Comstock Semi-Universal Dividing Head

For Hand Millers

It relieves your expensive universal machines of much work they ought not to do, and enables you to mill cutters, reamers, counterbores and similar small work just as quickly and accurately on a hand miller.



Write for full description of this economy device

Whiting & Comstock
32 Union Place, Hartford, Conn.

BECKER



Continuous Millers

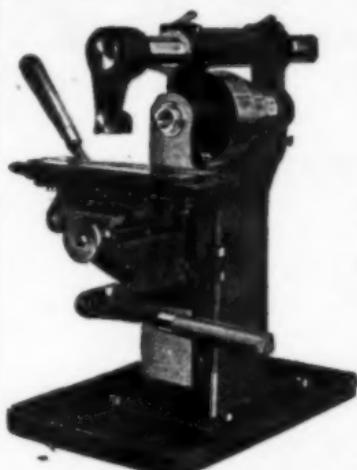
Reduce the costs for duplicate pieces because the machine operates all the time. This effects a great saving and increases your production.

The machine is sturdy and economical in power consumption and has quality and reputation built into every part.

Equipped with Becker High-Speed Cutters, the Becker Continuous Milling Machine gives remarkable results.

Write for Circular SD—Today

Becker Milling Machine Co.
Hyde Park, Boston, Mass.



Burke's No. 3 Bench Millers

Are Seasoned Tools

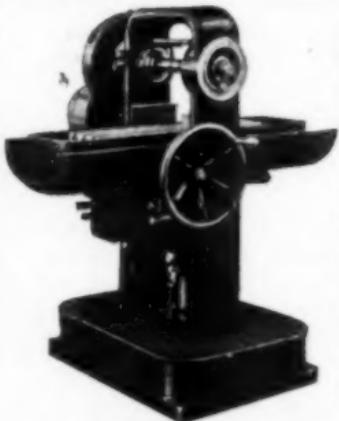
Our system of tests insures accuracy, and our methods of construction make it permanent. Frames and parts are carried 6 to 8 months, after work begins on them, before the completed tools receive our final O. K., and all parts are finished and fitted with exceptional care.

Longitudinal feed, 6 in.; traverse feed, 3½ in.; vertical motion of knee, 8½ in.; table surface, 3½x12 inch.

Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
Conneaut, Ohio

Augments Milling Economy



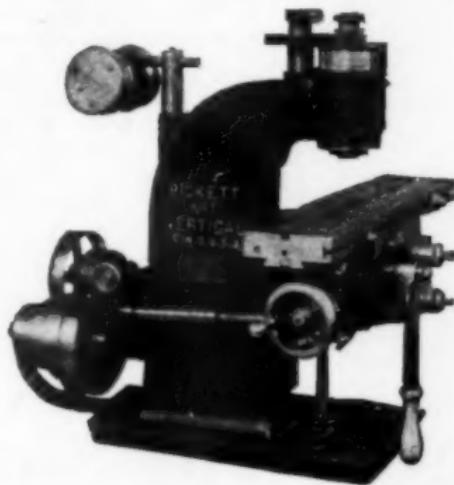
We are enthusiastic about the Briggs High Duty Milling Machine because it has been a real cost reducer from the very start.

It has a greater driving power than any other tool of its size and weight, and the solid rigidity insures accuracy. Table has screw feed and quick return. Eight changes of feed. You are assured of correct alignment at all times.

Economies are necessary; don't miss this one

GOOLEY & EDLUND, Inc., Cortland, N. Y.

No. 1 BICKETT Style C
Vertical Milling Machine
Back Geared, Power Feed



Longitudinal Feed, 16" — Transverse Feed, 5" — Vertical Feed, 8".

Ball bearing throughout.

Will make substantial cut with 2" end mill.

Guaranteed to run at as high a speed as any end mill will stand on any kind of material.

A money maker for the die maker.

Write for Circular "U"

Bickett Machine & Mfg. Co.
1110 Richmond St., Cincinnati, O.



Beaudry Hammers

For General Forging

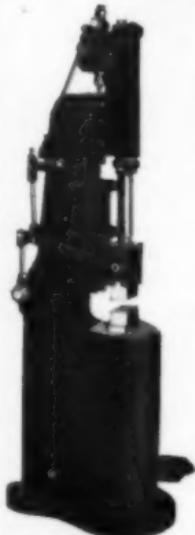
Saves Fuel, Time and Labor.
Cuts Forging Costs in Two.

Belt or Motor Driven

Beaudry & Co., Inc.

141 Milk St., Boston, Mass.

SALES AGENTS—The Machine Tool Engineering Co., Inc., New York City; Brown & Zortman Machinery Co., Pittsburgh, Pa.; W. M. Pattison Supply Co., Cleveland, O.; Eccles & Smith Co., San Francisco and Los Angeles, California; Hallidie Mchly. Co., Inc., Seattle, Wash.; The Portland Mchly. Co., Portland, Ore.; Alfred Herbert, Ltd., Coventry, Eng., London, Paris, Calcutta, Yokohama; Sherritt & Stoer Co., Philadelphia, Pa.; The English Tool & Supply Co., Kansas City, Mo.; The E. L. Essley Mchly. Co., Chicago, Ill. and Milwaukee, Wis.



The Barr Pneumatic Hammer

Is recognized today by progressive shop men as the ideal light power hammer!

A tool which should be in every up-to-date shop and tool room. A tool which repays its cost in short order and which you will truly appreciate every day you own it.

Expertly designed—exceptionally well built—simple—economical and dependable. Installed just where you want it, without expense of foundation, belts, shafting or motors.

Readily moved right to the job inside or outside.

Write for Bulletin 10H.



It's Portable

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, size 7-16 to 5-8 in.

Built in Eight Sizes

Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.
Rochester, New York

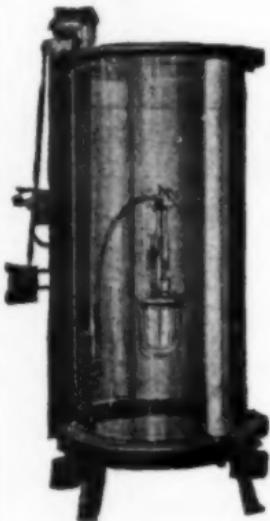


Blueprints

The Wickes

Continuous Electric.
Sells at half the
price. Uses half
the current
of others.
Perfect prints
up to 48" in
width and of
unlimited
length.

Wickes Bros., Water St.,
Saginaw, Mich.

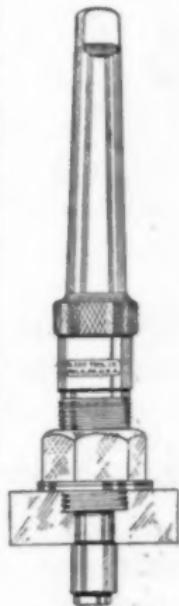


Electric Blue Printing Machines

Write for Catalogue B-3

Buckeye Engine Co.
Salem, Ohio

The Alert Boring and Facing Tool Made in Three Sizes



This handy tool is for use on turret lathes, automatic screw machines and drill presses, for facing, counterboring and radiusing where a fine finish is desired, and for boring large holes where the cost of large high-speed drills is prohibitive.

Holes up to six inches deep have been bored in one cut, leaving a very accurate hole and a good finish, due to the fact that the tool is guided at the bottom.

The body is made of the toughest material and specially heat treated to give maximum strength, and fitted with high-speed steel blades.

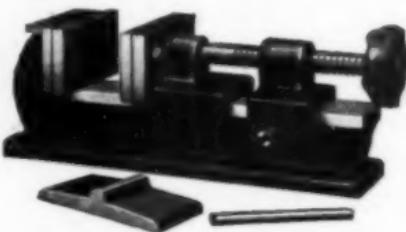
*Write for descriptive circular "H"
and price-list*

WE ALSO MANUFACTURE

- Patented Ratchet Tap Wrenches
- Patented Roller Grip Arbors
- Patented Roller Grip Mandrels
- High-Speed Solid Tap Wrenches
- Hand Knurling Tool Holders
- And Rivet Sets

Alert Tool Company
237 North 6th St., Philadelphia, Pa.

GEM VISE



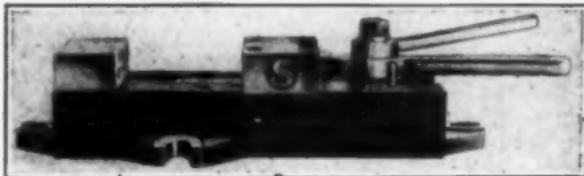
Drill Vise suitable for the Tool Room and Machine Shop. Write for prices and further description.

Made by

J. E. Martin Tool & Die Co.
548 West State Street, Springfield, Ohio

"Supreme" Quick Action Vise

Among the things that make it supreme are its exceptional range, its simplicity, its sturdy strength, and its absolute reliability



One important advantage of the "Supreme" Vise is that the T slot and bolt head are set on an angle, so that when the levers are tightened for work of any size, there is a wedging effect that makes it impossible to force them back in clamping the work.

It has many other advantages. Let us tell you about them.

SPAFFORD TOOL WORKS, - Hartford, Conn.

Wedg-lok Swivel Vises



Adjustable to Any Angle

Wedg-lok vises are adjustable instantly to any angle and can be changed to any other angle instantly —no screws, springs, wrenches, cams, or other troublesome parts to cause delay.

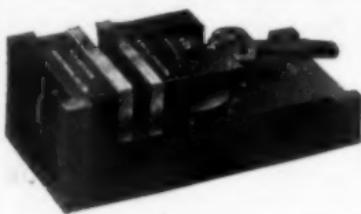
Vise automatically locks to any angle with tightening of jaws. One hand does the trick. Can be used in permanent position at any angle by simply tightening thumb screw under locking screw.

Locks Solid—No Vibration

When the Wedg-lok vise is locked ready to use it is perfectly solid and does not vibrate. The vise is locked tightly into the base. This gives all the advantage of the stationary vise with the swivel feature in addition. Write NOW for literature and prices. Sold on Money-Back Guarantee.

The Jahant Foundry & Heating Co.

205 Steiner Ave., Akron, Ohio, U. S. A.



Nestor Vise

Here are its Features:

Work is gripped almost instantaneously—moves from maximum to minimum with quick action sliding jaw.

For size and weight an extraordinary gripping range is provided.

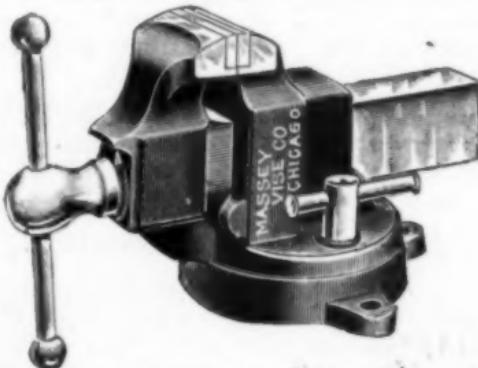
Hole can be drilled at right angles without taking work from vise.

Special provision makes it impossible for jaws to cock up. Immediate delivery.

Write for particulars, sizes and prices

Nestor Manufacturing Co., Inc.

40 W. 13th St., New York City



From the standpoint of durability, ease of operation and economy, Massey Vises have no superiors.

Write for Catalog No. 18.

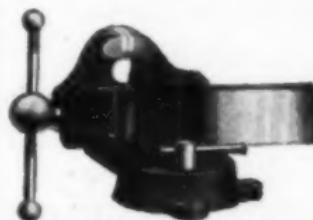
Massey Vise Company

549 Washington Blvd., Chicago, Ill., U. S. A.

The Mechanics' Favorites



Solid Jaw, Stationary Base



Solid Jaw, Swivel Base



Universal Double Swivel
Toolmakers' Vise



Yost Drill Press Vise

Yost Vises

Have a high reputation among skilled mechanics the world over—

Because every Yost user knows he has a vise that can be relied upon to handle his work to the best advantage and save his time, increasing his value to himself and his employer.

Because every Yost Vise is correctly proportioned to withstand hard usage at the points of severest stress, and is constructed of a metal composition that has proven exceptionally dependable by countless tests.

Because the several designs of Yost Vises, of which four are shown at the left, meet the most exacting demands of every kind of service.

Because our up-to-date plant enables us to make Yost Vises just as we want them—and as you want them.

*Write for illustrated Catalog
You'll need it for ordering*

Yost Manufacturing Co.
Meadville, Pa.

Pattern Shop Machinery

Special Prices if you refer to this ad.



Band Saws

Chicago No. 00 27 in. Wheels
" No. 0 32 " "
" No. 1 36 " "



Saw Tables

Chicago No. 5 Stationary Table
" No. 9 Tilting Table
" No. 10

Boring attachment if wanted.



Jointers

8 in., 5 and 6 ft. tables and guard.
12, 16, 20, 24 and 30 in., 7 ft. tables
and guard.

Trimmers, Lathes, Core Box Tools, etc.

Ask for full descriptions

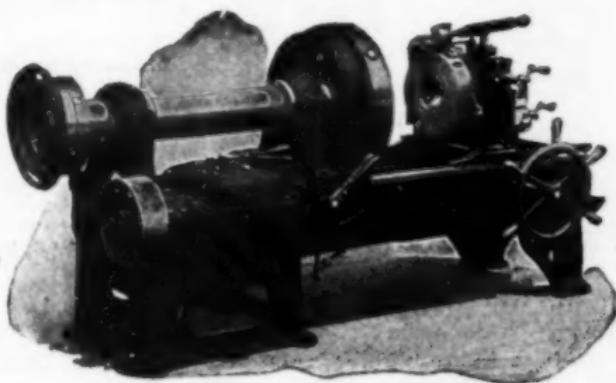
Chicago Machinery Exchange

1211-1227 Washington Boulevard, Chicago

Machine Tool Makers

should investigate carefully the facilities offered by **Hitchcock's Machine Tool List** for reaching this trade in all parts of the country. Its circulation is specialized to completely cover *every line of manufacture* in which machine tools are used—as well as all railroad and other tool-using shops—with a thoroughness and effectiveness not equalled by any other advertising medium.

Better pipe machines are bound to lower your shop costs



(No. 4 Peerless. Belt Drive. All Gears are Covered)

WITH LABOR and raw materials costing you more, it becomes necessary to economize by installing the best machines available. The many conveniences embodied in B. & K. pipe machines are a practical guarantee that your shop costs on this kind of work will be down to the bottom notch.

Our 17 styles and sizes—for pipe from $\frac{1}{4}$ to 18 in. diameter—enable you to choose the machine best adapted to your needs.

All B. & K.s. are fitted with the Peerless Adjusting Mechanism, enabling you to make instant adjustment to the thousandth of an inch without the use of tools.

B. & K.s. assure you of top-notch capacity, accuracy and economy. Write us about your needs.

**Bignall & Keeler Machine Works
Edwardsville, Ill.**



No. 24 Press

Efficient
Equipment
Atlas Presses

for building and repairing automobiles and general machine shop operations requiring pressure up to 25 tons and centering capacity up to 38 inches. For driving mandrels; bending and straightening, broaching, embossing with dies, setting bushings and many other every day manufacturing jobs, there is an Atlas Press. All sizes for all purposes. *It will pay you to investigate.*

Atlas Press Co.
317 N. Park Street,
Kalamazoo, Mich., U. S. A.

Lourie Hydraulic Bulldozer at Work



A Valuable Machine for Forge Shop
MADE BY
LOURIE MANUFACTURING CO., Springfield, Ill.

**Cap.
20
Tons**

**List
Price
85⁰⁰**



WEAVER Forcing Press

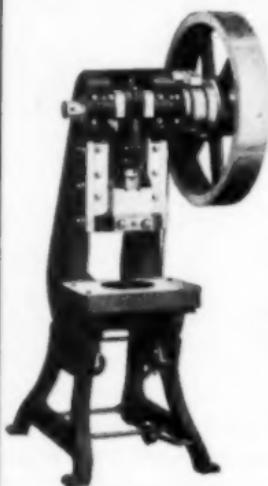
WE ARE SPECIALIZING upon this one size and style of press. It is the ONLY press we make, therefore we are able to produce a better article at less money than were we compelled to carry the overhead necessary to produce a great variety of styles.

5-inch, 9-pound channel steel frame, 32-in. wide, 15-in. hand wheel, carried upon ball bearings. Bronze Thrust Bearings, Screw 2 in. in diameter with 3-pitch Acme thread. Range of movement, 12 in. The screw does not revolve.

**List Price (^{32-in.}
_{Width}) \$85.00**

**Weaver Manufacturing Co.
2179 So. 9th Street, Springfield, Illinois**

Here Is A Press



With Plenty of Steam
Back of THE PUNCH

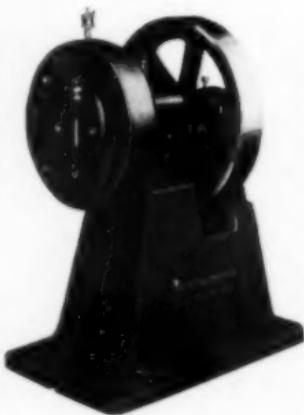
HIGH DUTY
ROCKFORD
PUNCH PRESSES

Made in straight side and
inclinable types. Their great
power backed by rigid design
enable them to do the work
you demand and stand up to it.

Write For Catalog

Rockford Iron Works
Rockford, Ill.

3,000 Blows a Minute



The Etna Swager

strikes them that rapidly with a pair of grooved dies, quickly and accurately pointing, tapering or reducing bar stock in sizes from $\frac{1}{4}$ " to $4\frac{1}{2}$ " diameter. It replaces power hammers for this work with a gain in production of from 500 to 1000%.

The swaging process is one of great possibilities in the way of quickening and cheapening production. Get in touch with us, and see if we cannot save money for you with the Etna Swager. Our catalogue, which explains the machine fully, may suggest something to you. Glad to send it.

The Etna Manufacturing Co., **TOLEDO,
OHIO**



Are you using all the Greenerd Arbor Presses that you profitably can?

Of course you have one or more Greenerds in your shop—nearly everybody has.

But do you know how the Greenerd Line has been improved and extended within the last few years, to save time, labor and trouble in numerous ways that you may never have thought of?

Greenerd Arbor Presses

Are now made with pressure capacities ranging from 15 pounds up to 40 tons

They are now designed for *any kind* of light or heavy work where a steady pressure may be applied, from driving pins into and out of small rolls to forcing in crank pins and bushings, straightening automobile axles, removing gears from automobile transmission counter-shafts, and hundreds of other purposes which we haven't the space to enumerate—in some cases supplanting the hydraulic press.

Over 30,000 Feet of Floor Space

Are now devoted to the manufacture of Greenerds only, in order to supply the demand for these indispensable, money-saving tools.

If you have been using a few of the small Greenerds to advantage, you'd better send for the latest Catalog, which may disclose other good things that are in store for you. Lest you forget it and then regret it, you'd better mail request now.

Edwin E. Bartlett
Nashua, N. H.

Twice or Thrice The Output

With the Acme Roll Feed
On Any Make of Press

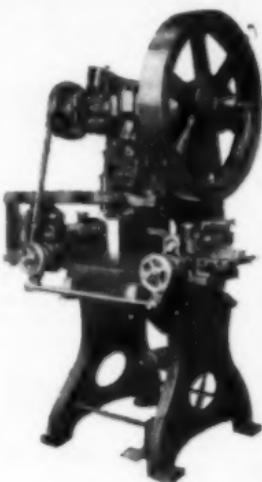
One machine now in operation
cutting can covers from coil stock is

Saving Over \$10 a Day

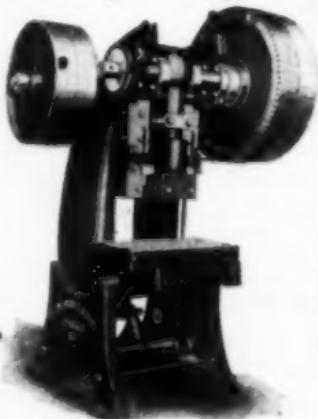
Maybe automatic feeding will do
as much for you. Why not write
us about your work, and let our en-
gineers figure out a substantial
economy for you? No charge
for advice, which may mean a
good deal of money to you.

Get in touch with us

Acme Machine Works
4125 E. Ravenswood Ave., Chicago, Ill.



Heavy Duty Inclinable Presses



Exceptional in their strength, power,
accuracy of construction and ability
to produce results at low cost.
Twenty-five years' experience built
into the machines, and always at
your service. L-J presses mean
maximum output, economy and
satisfaction always.

Our Dealers

Stocker-Rumely-Wachs Co., Chicago
W. J. Baird Machinery Co., Detroit
Herberts Machinery & Supply Co.,
Los Angeles and San Francisco, Cal.
J. L. Lucas & Son Inc., Bridgeport, Conn.
Brown-McDonald Mchly. Co., St Louis
Northern Machinery Co., Minneapolis
Clark Machinery Co., Cleveland, Ohio
Patterson Tool & Sup'g Co., Dayton, O.
Dale-Brewster Mchly. Co., New York
Swind Machinery Co., Philadelphia, Pa.

*Write us or them
as most convenient*

Loshbough-Jordan Tool & Mch. Co.
Elkhart, Indiana



BELOIT

Moderate Cost
Hand and Power

Punches, Shears Bending Rolls

Power

Direct Connected Motor or Belt Drive

Combined Punches and Shears.....	6 sizes
Double End Comb. Punches & Shears.....	3 sizes
Alligator Shears.....	5 sizes
Single B. G. Splitting Shears.....	5 sizes
Double B. G. Splitting Shears.....	3 sizes
Single End Punches.....	6 sizes
Initial Type Bending Rolls.....	26 sizes
Pyramid Bending Rolls.....	16 sizes

Hand

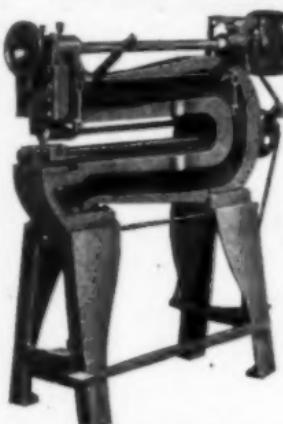
Bench Splitting Shears.....	08 & .04
Bench Three Spindle Punches.....	4 sizes
Bench Punches, deep throat.....	5 sizes
Lever Punches, increased capacity....	4 sizes
Lever Shears for round and flat iron....	7 sizes
Lever Splitting Shears.....	4 sizes
Lever Boilermakers' Punches.....	6 sizes
All steel Lever Shears for cutting twisted steel bars for concrete work	2 sizes
Combined Punches and Shears.....	7 sizes

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

Universal Metal Cutter

The New "GRAY"—Made in Four Sizes



Nos. 0, 1, 2 and 3 machines
have capacities as follows:

18"	throat,	capacity	1/8"	plate
34"	"	"	3/16"	"
36"	"	"	3/8"	"
36"	"	"	5/8"	"

It is **not** a rotary shear. Feeds like a sewing machine. Cuts any intricate pattern without springing or buckling the sheet, and leaves both edges smooth. Covers a field of its own far beyond shearing work, often replacing forging. Saves time, money and labor.

Better get the details

W. J. SAVAGE CO., Knoxville, Tenn.

"QUICKWORK"

REGISTERED U.S. PATENT OFFICE

Rotary Shears

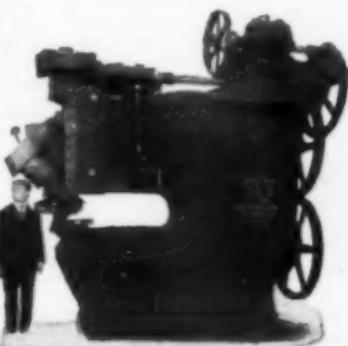
Made in 6 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

Write for catalogue

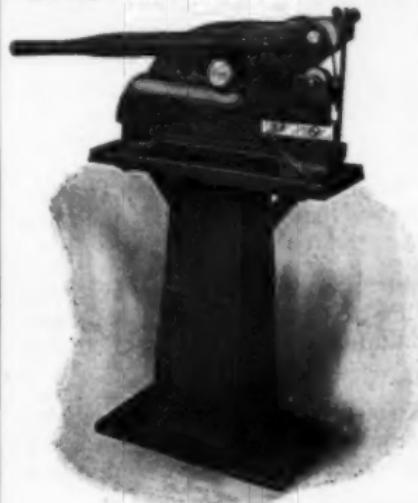


Patented June 3rd, 1913

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.



Nos. 1, 2 and 5 Shears and Rod Cutter



Nos. 3 and 4 Shears

Send for Shear Catalog

Manufactured and For Sale By

W. C. & F. C. TUCKER, Hartford, Conn., U. S. A.

Hercules Shears and Rod Cutters

No. 0—Shear (Tool Makers Bench Machine) Fitted with Bushings to Cut $\frac{3}{16}$ " & $\frac{1}{8}$ " Iron Rod and under.	$\frac{1}{16}$ " Flat Iron and under.
No. 1—Shear Fitted with Bushings to Cut $\frac{1}{8}$ " & $\frac{1}{16}$ " Iron Rod and under.	$\frac{1}{16}$ " Flat Iron and under.
No. 2—	" "
No. 3—	" "
No. 4—	" "
No. 5—	" "
No. 3—Plain Shear $\frac{1}{4}$ " Flat Iron and under only.	$\frac{1}{4}$ " "
No. 4—	$\frac{3}{16}$ " "
No. 5—	$\frac{5}{16}$ " "

Shear blades have a draw-in cut with no tendency to crowd work out of shear. Pressure is directly over the cut by a rolling contact. Arm of movable blade is operated with a steel band. No springs on the machine.

Our Pipe Benders Meet The Demand



Ever since their invention our hand Pipe Benders have had a steady sale and have given universal satisfaction.

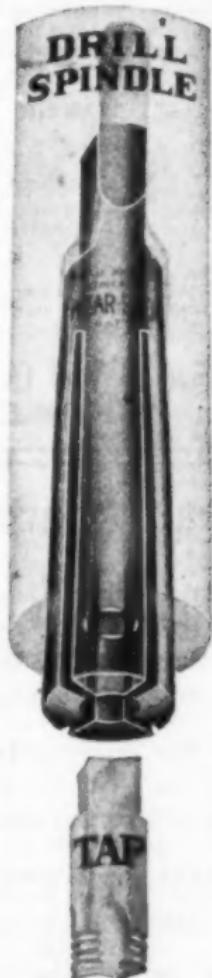
Recently, we have made some improved attachments that permit of a wider range of work and open up a new field in the kind of bending the machine will accomplish.

If you do pipe bending you will find our machine an economical, simple and very efficient appliance in reducing costs and doing better work. For 2" and under.

We have a Bulletin waiting for you. Send for it now.

Pedrick Tool & Machine Co.
3644 N. Lawrence St., Philadelphia, Pa.
Manufacturers of Cylinder Boring Bars, Portable Millers, Crank Pin Turning Machines, etc.

They Have Proved Themselves
“Wear-Ever” Tap Chucks



Have Demonstrated That
They Can Save You Time,
Taps, and Temper

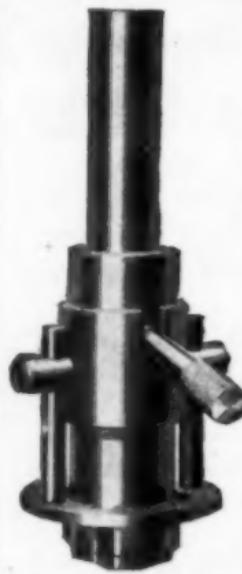
Automatic adjustment requires no truing up of the tap. It is right when you put it in, and stays right without further attention.

Self-centering, the tap cannot help running true, and we know that a true running tap is seldom broken. Hence economy in taps.

Making no trouble for the operator, it conserves his nervous energy and permits him to apply himself strictly to the business of tapping, which is what you want him to do.

*Let it prove itself to you
Send us your trial order*

Scully-Jones & Company
Suite 555 Railway Exchange Bldg., CHICAGO, ILL.



A sure reducer of tapping costs

With labor costs 'way up, the necessity for speedy, accurate production becomes more vital daily. Tapping costs are reduced 50 to 75% with the

Murchey Patent Automatic Collapsing Taps

They act with greater safety to the work, last longer than solid taps, save the time of backing out, and eliminate the danger of injuring the threads.

*There are more good points—
all aiding economy. Let us
send you full information.*

Murchey Machine & Tool Co.
58 Porter Street, Detroit, Mich.

Big Capacity—Small Space



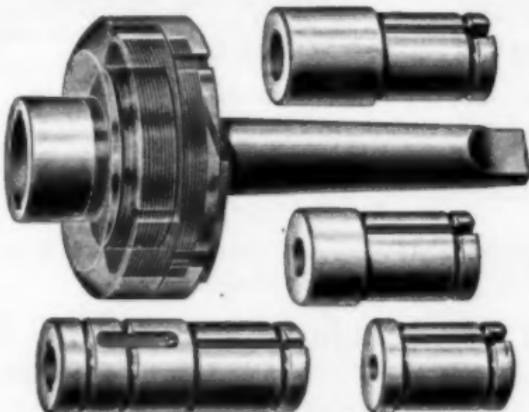
A set of Nicholson Expanding Mandrels, taking from 1" to 7" round or square holes, will save time, labor and expense for the machine shop.

Increase production by equipping your shop with "Nicholson". Try a set and let them prove their worth to you.

W. H. NICHOLSON & CO.
117 Oregon St., Wilkes-Barre, Pa.

NICHOLSON
Expanding Mandrel

The Safety Drill and Tap Holder Saves Time and Taps



The Four Sizes Cover 0 to 2½-in. Diameter

Changes from drill to tap, or tap to drill, without stopping the spindle.

It taps to the bottom. Driven by friction, the tap stops while the spindle revolves.

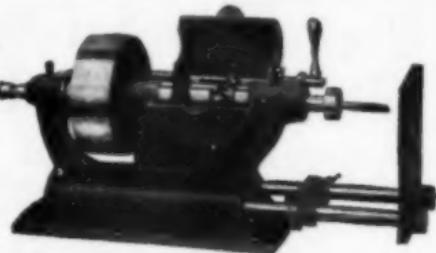
It is so simply designed and so well constructed that there is nothing about it to break or get out of order, and it is giving universal satisfaction because users have found it to be so convenient, accurate and generally efficient, while saving both time and taps.

*It has the high quality of all Beaman & Smith products
Write for description and prices—you'll be glad you did*

The Beaman & Smith Co.
Providence, Rhode Island

Workwell Tapping Machine

Built for Service
Has Many Fine Points



2 bar slide to hold work straight with tap.

Steel gears 2" diameter, enclosed and running in oil.

Extra large hardened clutch. One loose pulley with hardened clutch. Non-slip tap holders. Die holder for threading outside threads. Stop adjustment for any depth of thread.

MADE IN TWO SIZES.

Type B 2 for threads to $\frac{1}{4}$ " diameter Type C 2 for threads to $\frac{1}{2}$ " diameter

Give it a trial. Manufactured by

Workwell Engineering & Mfg. Co.

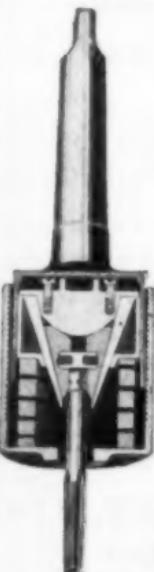
Dept. 2

616-620 W. Monroe St., Chicago, Ill.

Tap Breakage Is Unnecessary

There is no reason for breaking taps with the right kind of chuck. The—

Woodstock Improved Safety Tapping Chuck



automatically releases tap the instant it binds or touches bottom. Leading automobile manufacturers find it singularly efficient and economical on their difficult tapping. Works to full length of tap or where threads are only one or two deep. Made in five sizes.

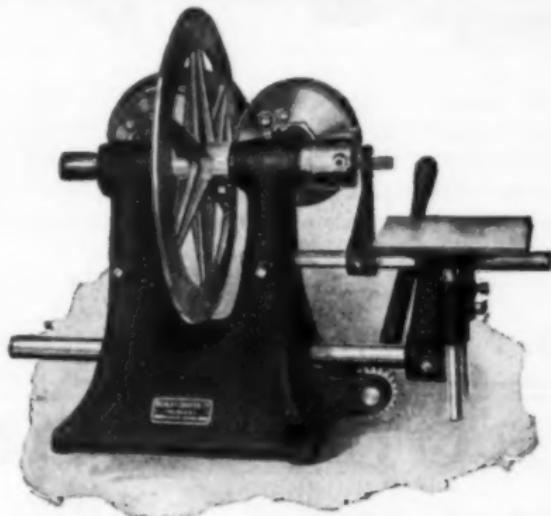
May we send one on trial?

Peter Bros. Mfg. Co.

115 Railroad St., Algonquin, Ill.

Rickert-Shafer Friction Driven Tapping Machines

Horizontal, Vertical and Radial



½" Horizontal Bench Tapping Machine

Horizontals: Three sizes, 3/16", 5/16" and ½", bench or floor type. Can be direct connected to motor.

Verticals: Two sizes, ¼" and ½". The spindle travels to and from the work, an improvement over the usual method of raising and lowering the table for each hole tapped.

Radial: Capacity, ¼" and ½" in steel. A sturdy, rigid manufacturing machine for tapping automobile and machine tool parts with the least possible amount of handling.

The Friction Drive is especially designed to insure a smooth running chuck spindle, to eliminate practically all tap breakage, and to save so much time that it materially increases the output.

Write for fully illustrated Tapping Machine Bulletin

Rickert-Shafer Co., 1110 Cherry St., Erie, Pa.

Extracts Taps Quickly

The Walton removes broken taps



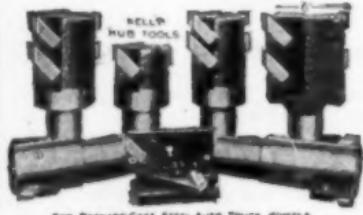
Without injuring the threads

To use this handy, inexpensive tool means that you will save many hours of your high priced mechanics' time. It has four crucible steel prongs or fingers which fit into the flutes, making it easy to remove the broken tap. We offer a 60-day free trial of any size from No. 8 to 1 1/4".

Send your name and address in today

THE WALTON CO., Hartford, Conn.

PRODUCTION



FOR PACKARD-CAST STEEL AUTO TRUCK WHEELS

WITH
KELLY
HUB
TOOLS

Insures Accuracy as well as Speed and Durability

Replaceable and Adjustable High Speed Blades

Send for Catalog J-5

THE KELLY REAMER COMPANY
CLEVELAND OHIO

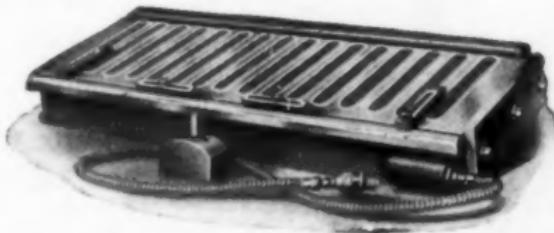


Magnetic Chucks a Necessity for Tool Room Grinders

a Heald Chuck is positive and strong.

Every shop should have one for its tool room grinder to hold miscellaneous work.

The Heald rectangular chucks range from $4\frac{1}{2} \times 10$ tool room size to a 14×36 for use on planers or millers.



RECTANGULAR TYPE—Adapted for use in grinding, milling, planing and shaping operations.

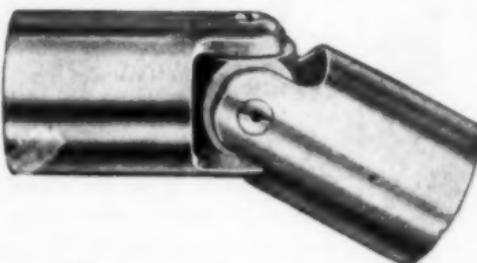
The Heald Machine Company

Worcester, Mass., U. S. A.

Your Local Machine Dealer Will Furnish Information and Quotations

Dependable Universal Joints

The "GIANT"—For Heavy Service



Efficient to an
angle of 45
Degrees

Vanderbeek
Universal
Ball Joints
for higher
angle drives

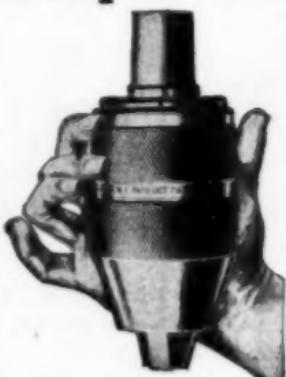
So dependable that when they are connected up you can practically forget them. They run smoothly, without play or looseness, they are self-oiling and dirt-proof, and they have a good margin of safety over their rated capacity. There are thousands in satisfactory use. *Write for description.*

Ainslie Machine & Tool Works

Successors to Vanderbeek Tool Works

HARTFORD, CONN.

Eclipse Self - Tightening Drill Chuck



Roller bearing.

Quickest and easiest grip, and it never slips.

Self-tightening. No keys or wrenches.

It has no rival in its combination of quick and firm gripping, easy release, simplicity and accuracy.

Saves time and money on high speed drills.

You need it now. Why wait?

Nielsen - Barton Chuck Co., 106 S. Jefferson St.
CHICAGO, ILL.

Also makers of ARBORS for all kinds of Chucks
YOUNG, CORLEY & DOLAN, Inc., 115 Broadway, NEW YORK CITY
New York District Agents

Quick Chucking Without Air

The Barker Wrenchless

Reduces
Chucking
Time
Which
Means
More
Work
Done



Gives you all the speed
and economy of an air
chuck at far less cost

A simple movement of the lever
centers and chucks the work, mak-
ing it as easy and rapid of operation
as an air chuck. No expensive air
service to maintain; the wrenchless
chuck is complete in itself, and
hence is available where air pres-
sure cannot be had.

A feature peculiar to the Barker is
that the pressure on the piece in
chucking may be regulated at will,
adapting it to heavy or light work.

Ask
for
our
Booklet.
It is
interesting
and
free

BARKER CHUCK DIVISION
THOMAS ELEVATOR CO., MFRS.
22 S. Hoyne Ave. - - - Chicago, U. S. A.



We manufacture a great variety
Lathe Chucks, Drill Chucks, Centering Chucks
Also
Portable Jaws for Lathe face plates and Machine tables.

Let us send you our Catalog

The Cushman Chuck Co.

Established 1862

Hartford, Conn.

Get the "Sweetland Habit"



The "Sweetland Habit" is easy to acquire, because Sweetland Lathe Chucks are so quickly adaptable, so dependable, and so accurate through many years. Better write for Catalog and Price List No. 11-C to order from.

The Hoggson & Pettis Mfg. Co.
New Haven, Conn., U. S. A.

JACOBS IMPROVED DRILL CHUCKS

They please the operators

The "Jacobs Improved" are workmen's favorites wherever used, because of their convenience and ease of handling.

They please the employers

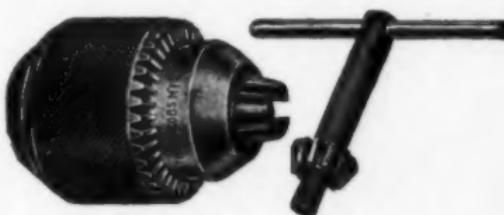
They are also the favorites of the man with the purse in thousands of shops the world over, because they insure a maximum output with a minimum of drill breakage.

The drill chucks of widest use

The fact that the "Jacobs Improved" are the drill chucks of widest use is the strongest guaranty that every one of our claims is based upon a solid fact.

You should have the Catalog

The Jacobs Mfg. Company
Hartford, Conn., U. S. A.





Quality! Service!

THE confidence that we are in a position of unusual advantage to serve you in the matter of screw and chucking machine products has, we believe, a strong basis.

Our Screw Products Dept. is equipped with *Six-Spindle Automatic Screw Machines* and *Multiple-Spindle Automatic Screw Chucking Machines* of every size.

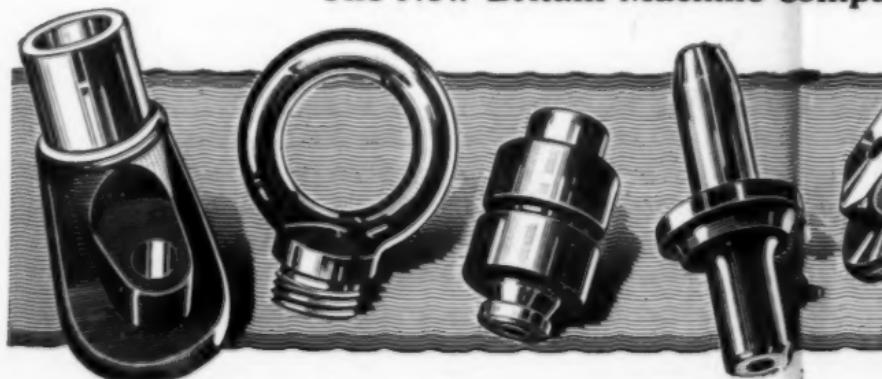
Their ability to do *accurate work*—a logical result of correct design and substantial construction—is eloquently attested by their general use among automobile and other manufacturers.

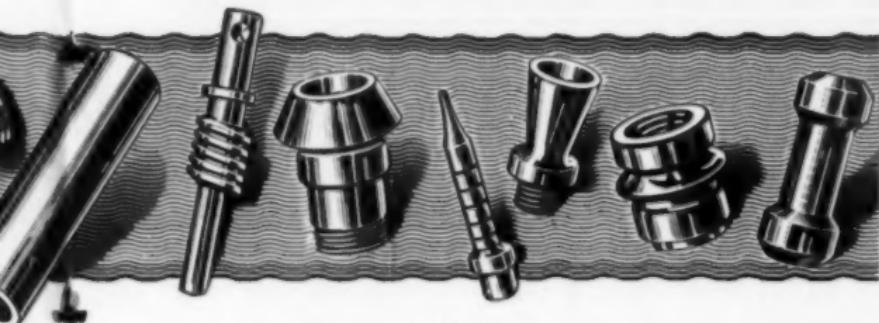
As to *productive capacity* neither machine has a peer.

The *Six-Spindle Automatic Screw Machine*, through the greater tooling capacity of its six spindles, eliminates the necessity for

May we have the pleasure of figuring on your requirements for pr

The New Britain Machine Company





Service! Economy!

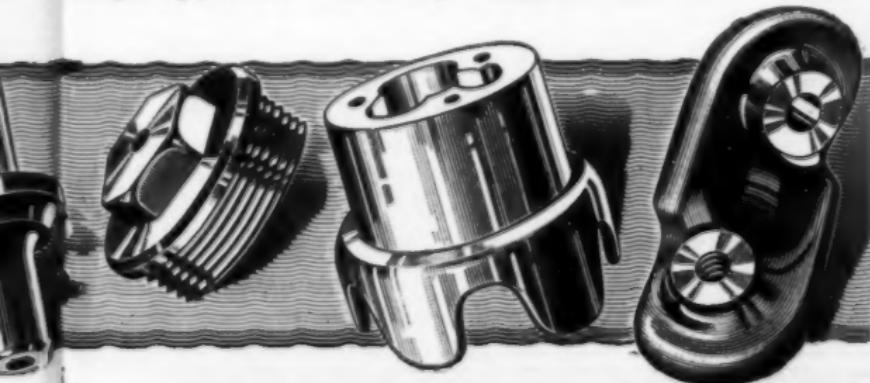
rehandling complicated work; enhances production of average work by subdividing the longer operations; and, on the simpler work, finishes two or three pieces at each indexing. Its advantage in output over other machines ranges from 50 to 200%.

The *Multiple-Spindle Automatic Chucking Machine*, by reason of its ability to finish a casting or forging involving a series of operations, in the time of the longest single operation (or subdivision thereof), is capable of output ranging 300 to 500% above that of the turret lathe or hand screw machine.

In short, the "New Britain" Screw Products Dept. offers you a quality service at a cost made possible only through the employment of methods and machinery of extraordinary efficiency.

ments for products made from castings, forgings, or the bar?

the Company, New Britain, Conn.



They Gave for a Lifetime

*—the men who came back
with wound stripes*

Did these men stop to argue? Then don't you do so.

Thank God the war is over and show your thankfulness by helping to pay for the overwhelming preparations that made more fighting unnecessary.

You are not asked for anything like the sacrifice that would have been required had the struggle continued as was expected.

We cleaned up quickly over there—let's clean up quickly over here. The good old sign "Business as usual" is waiting to be hung out. Settle up and settle down. You invest at substantial interest.

Victory Liberty Loan

Space contributed by

HITCHCOCK'S MACHINE TOOL LIST

Prepared by American Association of Advertising Agencies
cooperating with United States Treasury Department.

The "Triad" Lead and Cyanide Bath Furnace

Three Heating Operations at Once
With only One Oil or Gas Burner



Heating for Hardening in the Lead Bath
Heating for Hardening in the Semi-Muffle Furnace
Heating for Forging in the Combustion Department

The "Triad" occupies only two feet square floor space, yet it permits three distinct heating operations at one time without interference, saving in both equipment and floor space. Using only one gas or oil burner, with which tool steel temperatures can be obtained in 35 minutes from a cold start, it effects a big saving in fuel cost. The lead pot, which is suspended to secure more even heating, lasts several times longer than when resting on a supporting base.

The greatly improved method of heat distribution insures absolute uniformity of temperature to the entire pot area at all times, and practically eliminates oxidation. It gives better results at less cost.

We shall be pleased to mail full description upon request

THE W. R. BENNETT CO., **Elmwood, Conn.**

Machine Designing

We design machines for special purposes, develop an idea along correct mechanical lines, improve defective designs, often making a success out of a failure. Yankee ingenuity, mechanical expertness and the "knack" which comes from long experience have enabled us successfully to deal with some knotty mechanical problems. If you have one, take it up with us; our engineers will be glad to advise you.

We have a splendidly equipped shop for putting ideas into metal; can make tools and jigs for you if you wish, and guarantee the work.

A letter may start something to your advantage; will you write it?

Southworth Machine Company

Portland, Maine

Men Will Do More Work

With Better Equipment

A Ritchie-Wertz Modern Bench

will produce results just as surely as any other high class tool, because it helps the man to use his time and effort to the best advantage. It provides a convenient place for his blueprints, tools, stock, etc., a bench of just the right height, and a 5" guard around three sides of the top. Let us refer you to up-to-date manufacturers who are using it. A line will bring complete information.



THE RITCHIE-WERTZ CO., Dayton, Ohio



Gear Cutting Extraordinary

Showing several Superior Automatic Gear Hobbers cutting gears of large diameter and coarse pitch in steel

The rapidity with which this work is done brings the cost of accurately cut gears of large and medium sizes and coarse pitch down to a point where they may be profitably substituted for cast gears, and shows a marked economy over other methods of producing them.

If you are not using cut gears, the Superior Automatic may enable you to adopt them to the manifest improvement of your machine; if you are using cut gears now, it will help you greatly to lower their cost.

We are here to prove up on this proposition, and to help you save money. Tell us what gears you are cutting or wish to cut; we shall be glad to tell you, and demonstrate if you will, just how we can enable you to make more of them and pay less for their making.

*You'll find the correspondence interesting
Please write the opening letter*

Jones Superior Machine Company
Chicago, Illinois



T. H. L. Punches

**Insure a steady delivery
of the maximum amount
of uniform, accurate work**

They are uniformly constructed of the correct steel by experienced punch makers.

We guarantee their strength and accuracy, because we know what care and experience has gone into them, and what they will do.

Immediate delivery of regular sizes.
Special sizes quickly made.

How about a trial order?

T. H. Lewthwaite Machine Co.
415 East 31st St.,
New York City

Perfect Riveting

No Hammer Marks
Every Head Perfect

In its combination of speed, economy, quality of output and noiseless operation, there is nothing to compare with the

Grant Rotary Rivet Spinner

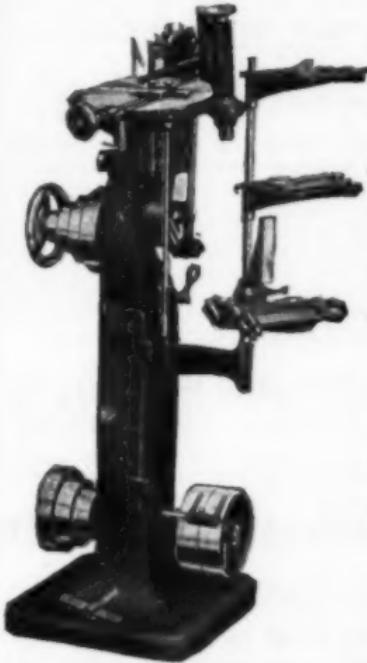
It rolls or wedges the shank, producing a highly polished head without hammer or tool marks, at the rate of a rivet a second, with cheap help. The rivets are uniform, with any degree of tightness or looseness desired.



Will you let us prove up?

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

Cochrane-Bly Machines Insure
Accurate, Low-Cost Filing



No. 2 Filing Machine

Accurate filing by hand is difficult for the expert; with the Cochrane-Bly No. 2 Filing Machine it is rapidly and perfectly accomplished at minimum cost.

Table is adjustable, also length of stroke, and there are four speeds.

The standard equipment includes arms for Hack Sawing and extension holders for Jig Saws.

This machine meets the most exacting tool room requirements where close finish is desired.



Bench Filing Machine

Glad to mail you complete description

Cochrane-Bly Company
Rochester, N. Y., U. S. A.

Also Cold Saws and Automatic Cold Saw Sharpeners
Universal Shapers for Die and Tool Work



Get Accurate Tapers

Surely, Easily, Cheaply

There are no two ways about it. Time and time again it has been demonstrated beyond all shadow of doubt that the

Hartford Taper Gage

saves time and money in securing absolute accuracy in tapers far beyond its moderate cost.

If you turn tapers, the only question that remains is, "Will you come in on a good thing?"

*Proof furnished, of course
You'll be pleased—so will we*

Hartford Special Machinery Co.

285 Homestead Ave., Hartford, Conn.

Simplify Your Gauging System

Our Amplifying Gauge Permits Discarding 75% of Your Snap Gauges

Much better than snap gauges, because it shows every inaccuracy, either over or under size, in .0001".

You can adjust it in a few minutes for any size piece up to 5½" on the plate, and 8" between centers, thereby saving much time and expense.

Used on government work and in big plants where quick, accurate gauging is essential.

Catalog No. 100 contains a number of interesting illustrations



THE NORTH SIDE TOOL CO., Dayton, Ohio



Terrell's Steel Fixtures in a Detroit Motor Plant

Terrell's Steel Equipment

The Kind Without Up-Keep Cost
And that Always Retains its Value

The element of cost:

A considerable element of cost in much factory equipment is in the up-keep, and Terrell's Steel Fixtures last almost forever with practically no charge against maintenance.

Another such element is in depreciation, and Terrell's Steel Equipment is essentially as good as new for a generation.

Then changes in stock, in arrangement, in factory buildings, etc., often make a great deal of equipment obsolete, whereas Terrell's Steel Fixtures can be taken down and set up again without damage, they are so flexible in arrangement that they can be readjusted to new purposes, and they can be added to or taken from much like a sectional book-case.

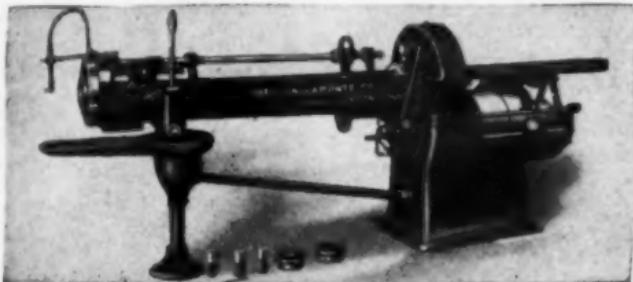
No one doubts that steel equipment is the *best*, and the Terrell method of construction makes the Terrell Fixtures the *cheapest* from the standpoint of a sensible *permanent investment*.

Facts and figures at your service without obligation

Terrell's Equipment Company

Hall & Division Sts., Grand Rapids, Mich.

This is only one of the
11 TYPES - 5 SIZES
Ask for a complete catalog



J.N. LAPointe CO.
NEW LONDON, CONN.

Makers of Broaching Machines and Broaches.

Steel Spacing Washers

For the Milling Machine

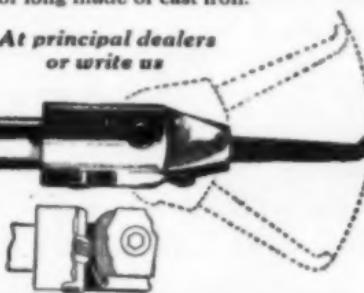


Furnished .003, .004, .005, .006, $\frac{1}{8}$ "
and $\frac{1}{4}$ " thick, cheaper than you can
make them; also $\frac{1}{2}$ ", 2" and 3" thick
or long made of cast iron.

*At principal dealers
or write us*

E-Z Set
Boring Tools

Made in 3 Sizes



The Unity Manufacturing Co.
4229 Lorain Ave., Cleveland, O.

Where you have to ream a tough
fibrous metal, you need a

McCrosky IDEAL Reamer



The IDEAL blades are only four in number, are short and cut with a left-hand spiral out of solid high-speed steel. Yet, though the assembled IDEAL Reamer is apparently one solid piece, it has a wide range of adjustment, while one set of IDEAL blades will outlast a dozen solid reamers and can be replaced at low cost in a few minutes.

The whole story of McCrosky Cost Cutting tools is found in our Efficiency Book No. 6

McCrosky Tool Corporation

(Formerly McCrosky Reamer Company)

Meadville, Pa., U. S. A.

Export Manager, B. Whittaker, 21 State St., New York



Style "C"



The Hinge



Style "B"



Style "G"



Style "O"



Style "Y"



Style "L"



Style "T"



Style "H"

GITS OIL CUPS

Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO.

1940 SO. KILBOURN AVE., CHICAGO



For power tools and similar purposes

Accurate, highly finished, complete on receipt, ready to attach. Manufactured as a specialty, we offer you the result of quantity production, in quality and price. Estimates given on large screw machine work, handles and screws of any description.

Write for price list and discounts

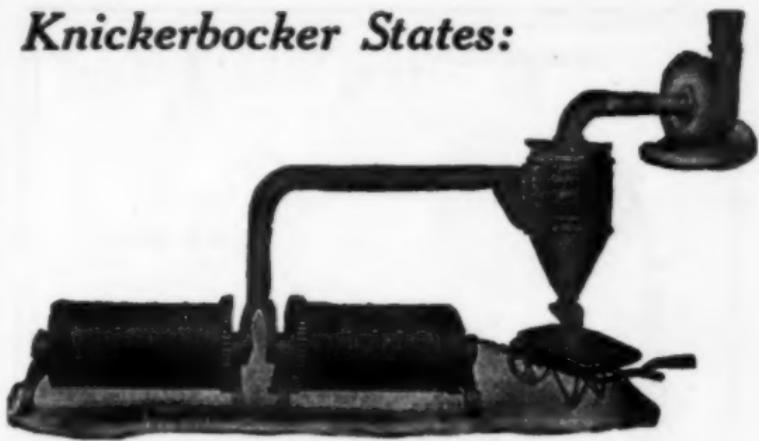
The Cincinnati Ball Crank Co.

Oakley, Cincinnati, Ohio



Handles
From
Steel

Knickerbocker States:



"Rarefieds" Save Power

Also Reduce Labor and Repairs



No matter from what angle you study "Rarefied" Dust Collectors, you will find that they not only give **better service**, but they operate at less cost and need fewer repairs than any other.

They are successful with the most difficult dust problems, including that of emery and polishing wheels, sand blasts, tumbling barrels, etc. They often save more than 40% in power. The dust is removed before the air reaches the fan, and there's no cleaning out by hand.

*An interesting Booklet gives full details.
Send for your copy today.*

The Knickerbocker Company
Jackson, Mich.

Pat. Jan. 30, 1917

Just What I Want



Automatic Extension Reel for Electric
Lamps.
Light just where wanted,
25 ft. of cord.
Automatically locks and rewinds.
Approved by underwriters.

The Cincinnati Specialty Mfg. Co., Inc.
1913-21 Powers St., Cincinnati, Ohio

Branch Offices:
205 Abbott Bldg., Philadelphia, Pa.; 39-41 Cortlandt St., New York City

Red-E Milling Dog and Driver

Assures Correct Spacing and True Taper



is invaluable in cutting gears and similar work, because it positively eliminates incorrect indexing, and thereby does away with spoiled or botched work. Dog cannot work loose, and cramping or springing of work is avoided. No adjusting is necessary for odd pieces.

*Uniformly successful in plants of every size
Send for description and interesting price*

The Ready Tool Company
Bridgeport, Conn.

Does a Better Job and Does it Quicker



The "Apex" Center Drill

A new device for centering lathe work which commends itself to operators because of its accuracy, its convenience, its economy of time, and the improvement it makes in the appearance of the work. The added countersink permits work to be faced clear to the center, which cannot otherwise be done without the use of half-centers and the troublesome make-shift of withdrawing the tail-stock spindle. It also enables the operator to face work without reference to other turning operations, as facing does not change the real center. This often saves costly handling of the piece and the changing of tools and dogs.

*We cannot tell all its advantages here
Write for the full story*

The Apex Drill Company
2455 W. McMicken Ave., Cincinnati, Ohio



Have you a drilling proposition on which you would save labor, time and money?

If so--have you considered the advantages presented by the Van Dorn Portable Drills.

Whatever the requirements--whether high speed or heavy duty drilling in wood, steel, iron, marble, etc., it is always ready.

Our switch is especially designed. We make our own motors and we know just what they are able to accomplish.

MEMBER OF



It would pay you to find out

The *Van Dorn* Electric Tool Co.
Cleveland, O.

Sales Offices in all leading cities

Canedy-Otto 20" Drills

Are Up-to-the-Minute Tools

These new and improved 20-inch power drilling machines combine simplicity, speed and accuracy for drilling holes up to $1\frac{1}{2}$ inch. They are rugged in construction, smooth and noiseless in operation, and have the graduated and automatic features found in high-priced tools. The gears are cut on automatic machines.

The bearings are of the best babbitt metal, with *Randall hydraulically pressed sheet graphite cones, which increase their life 300 to 400%.*

We do not believe the new and improved Canedy-Otto 20-inch Power Drilling Machines can be equalled—certainly not surpassed—in their output capacity for the investment. When desired, we equip them with motor all-spur-gear drive, also with new and improved tapping attachment.

*You will be pleased with both the quality and price
Glad to send you complete information upon request*



Canedy-Otto Mfg. Company
Chicago Heights, Ill.

Manufacturers of Forges, Blowers, Drills, Lathes and Grinders



Silver's 20" Power Drills

Few drilling machines have had harder tests than were given to a large number of Silver's 20" Drills in the traveling machine shops on trucks in France, where they demonstrated their high efficiency and great dependability on all kinds of rush work under most unusual conditions.

They are made in four styles—plain lever feed, lever and wheel feed, power feed and automatic stop, and with back gearing—also in 2, 3 and 4-spindle gangs.

Write for complete description of the 20" or 25" or both

The Silver Mfg. Co., 295 Broadway, Salem, Ohio

Don't Be Satisfied

Until You Investigate
"The Drill with the Pull"

"The drill with the pull" is not a mere catch-phrase. It means that the large pulley diameter and the ratio of gearing used insure the greatest "pull" or actual drilling power.

The "Aurora" has many other features which merit investigation.

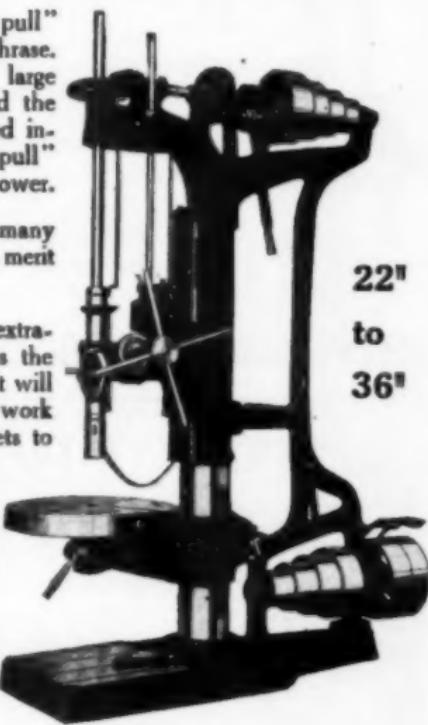
For instance, an extra-large bearing makes the table fool-proof. It will not tilt and spoil the work if the operator forgets to clamp it.

The worm wheel drops automatically, giving a positive release.

It has positive gears, encased in box. Gears are made of steel and hardened.

The "Aurora" throughout is most carefully built of the best materials, and proportioned to insure great strength and power. Modern shop methods and a low overhead enable us to put unusual values into our drilling machines for the price.

22"
to
36"



Don't be satisfied until you investigate the "Aurora"

The Aurora Tool Works
Aurora, Indiana, U. S. A.

Sellew Adjustable Drill Heads



save time by drilling
three holes at
once.

Why continue the
old way, when this
inexpensive device
will save time and
money?

We also make Spe-
cial Drill Heads with
fixed spindles.

Ask us



SELLEW MACHINE TOOL CO.,

Pawtucket,
Rhode Island



“Buhr” Drill Heads

Adjustable and Fixed Center

All-Ball-Bearing

Adjustable from 2 to 12
spindles.

Fixed center, any number
of spindles.

We guarantee our Heads
to stand up to capacity.

Nelson-Blanck Mfg. Company
Detroit, Mich.

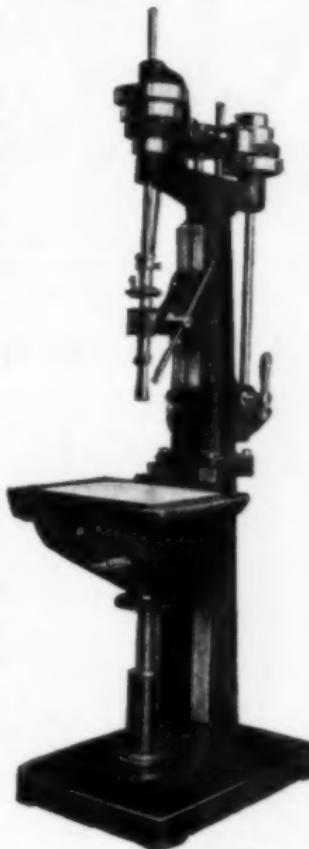
Edlund Quick Change Sensitive Drilling Machine Ball Bearing Throughout

You will find in the Edlund not only the best in modern machine tool practice, but also improvements and conveniences originated by our experts.

In transmitting the power *a straight endless belt* is used; this eliminates entirely the objectionable features of the quarter turn belt. Careful balancing gives extreme sensitivity and eliminates all vibration at high speeds.

The feed pinion bearing is extra long, and the sliding arm is extra large, having nine inch bearing surface on the column. The splash system of lubricating is used.

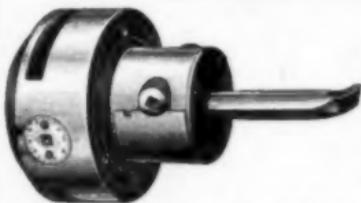
There are four spindle speeds of 510, 816, 1273 and 2038 r. p. m. with drive pulley running at 500.



There are more good points. Let us mail you the full specifications.

Edlund Machinery Company, Inc.
260-300 Huntington Ave., Cortland, N. Y., U. S. A.

Casler Offset Boring Heads Do Quick, Accurate Work



The Method is to clamp the tool or fixture on the milling machine table, and rotate the boring tool in the Casler Offset Boring Head.

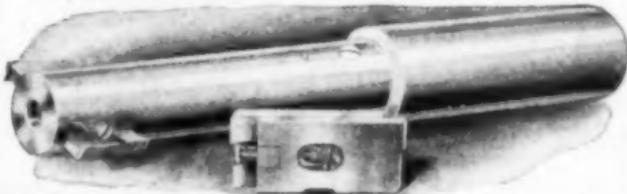
The Result is that you save time and labor on your work. You get close and accurate adjustments, and it's no trick at all to true up inaccurately bored holes in very little time. The head is compact and rigid, with no projecting corners to catch the work.

Styles and sizes to meet practically every boring requirement are shown in Catalog C—Write for it

MARVIN & CASLER CO., Canastota, N. Y.

Finished Holes—Any Size

With Madison Adjustable Boring Cutters and Bars



THE MADISON CUTTER is rapidly replacing reamers, because it does better work and insures absolutely straight holes of any size. Adjustable to .00025", and quickly set for any odd size. For instance, a 3 $\frac{1}{4}$ " cutter is set to ream a 3.756" hole in less than two minutes. Made of high-speed steel for steel, cast iron, bronze, aluminum and other metals.

Better have the description and price list

MADISON MANUFACTURING CO., - Muskegon, Mich.
Tool Agents Wanted.

Model "E-50" Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Can be furnished with special pulleys to drive main spindle any speed up to 10,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}'' \times 5''$, and will take work up to $4\frac{3}{4}''$ in height.

Surface of table is ground to insure
ACCURACY.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

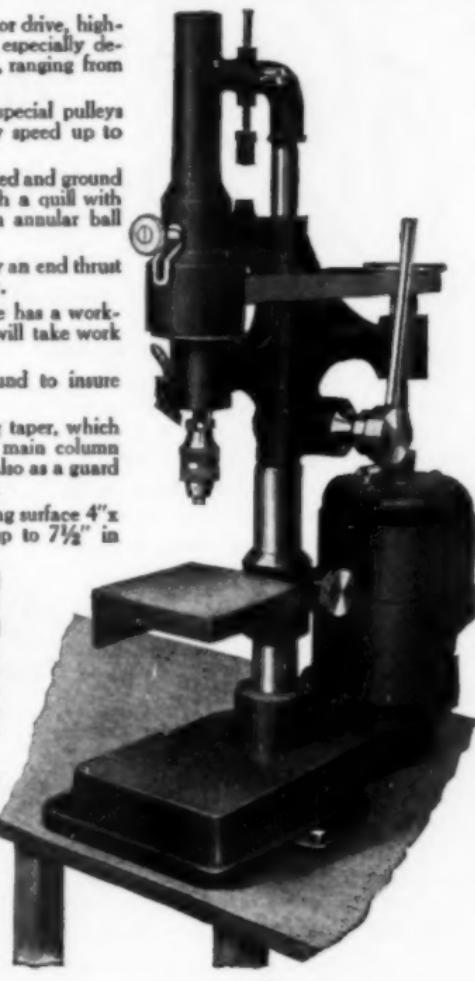
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitivity of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.



Height over all.....	24"	Spindle feed.....	2½"
Base.....	7½" x 18"	Weight.....	62 lbs.
Diameter of spindle.....	7/16"	Will drill to center of a 6" circle.	

Thos Universal Electric Drills

Licensed Under Burke Universal Motor Patent

Indispensable for all kinds of drilling, reaming and wood boring in the building of automobiles, steel and wood cars, boilers, auto bodies, and in railroad and structural shops, ship and dry dock work and machinery repairs. Can be operated on alternating or direct current, 110 to 250 volts. Furnished with cord and suitable feed attachment ready for immediate use. Attach to any lamp socket.

000	Drilling Capacity	1.4"
00	"	5-16"
0	"	3-8"
01	"	1-2"
1	"	9-16"

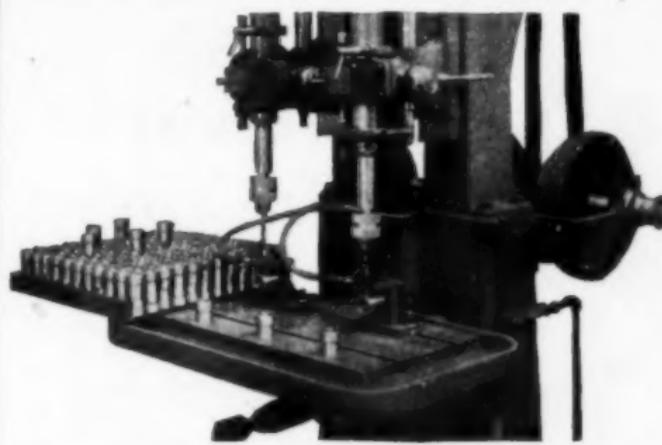
No. 6 Electric Grinder.



Jacobs Chucks used as regular equipment.

Independent Pneumatic Tool Company

Chicago New York Pittsburgh Cleveland
Detroit San Francisco Birmingham Montreal



THE *Avey* AUTOMATIC Operator Does Nothing But Load Jigs

Provides automatic approach and automatic return.

Depth gauge can be set for any desired depth of hole.

The instant the drill withdraws, the operator reloads.

The drill point is allowed to clear the work sufficiently to give operator just enough time to make the change. He operates as many spindles as the nature of work will allow.

THE MACHINE CROWDS THE OPERATOR. You can figure almost exactly what a day's output should be.

The Cincinnati Pulley Machinery Co.
Cincinnati, Ohio



High Grade Ball Bearing Drilling Machines

With 1, 2, 3 and 4 Spindles

Write for descriptive circular

Francis Reed Co.

43 Hammond St.
Worcester, Mass.

Fast Drilling

At 12,000 R. P. M.

Equipped with Norma ball bearings and driving the drill at high speed, it cuts through the metal with great rapidity, saving time and drill breakage.

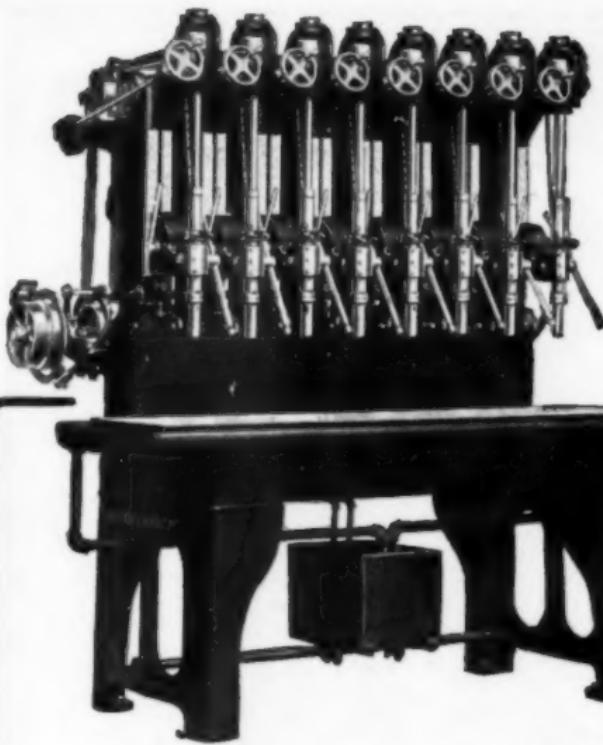
The belt adjuster and *automatic belt stretch compensator*, which is an exclusive feature, help to eliminate vibration. The circular describes other highly valuable special features.

*Also made in floor type,
with one to four spindles*



The Demco Machine Tool Co.

Successors to The DeMooy Machine Co.
706 Frankfort St., N. W. Cleveland, Ohio



Henry & Wrights 1 to 8 Spindles, for $\frac{1}{4}$ " Drills & Smaller

The new Standard of Feeds and Speeds, as shown in our Catalog, has been adopted by leading experts the world over. It puts the art of drilling upon a scientific basis, with a tremendous increase in drilling efficiency.

Henry & Wright Drilling Machines have been designed in harmony with the latest developments in scientific drilling, with the practical result that they drill more holes in a given time.

The Catalog explains; write for a copy

The Henry & Wright Mfg. Co.
760 Windsor St., Hartford, Conn.

OVER-SEAS REPRESENTATIVE



ALLIED MACHINERY COMPANY OF AMERICA
130 BROADWAY, NEW YORK, U.S.A.



Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

Drilling Machines

For Bench Use

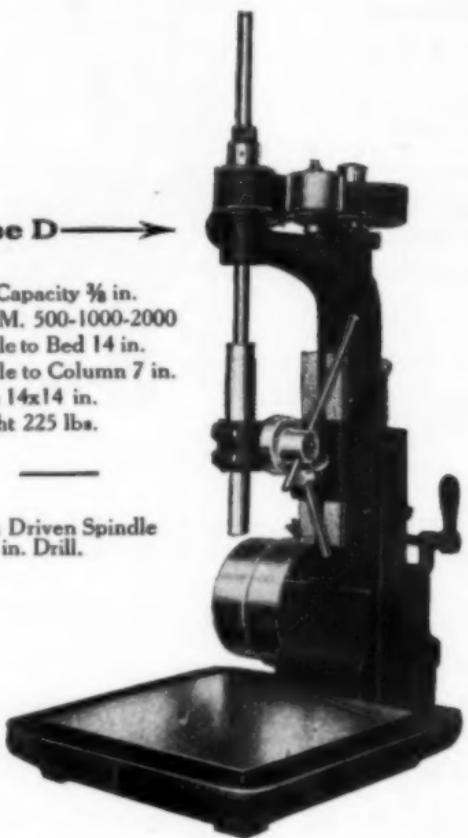
Hand and Power Feed

Gear Driven

Type D →

Drill Capacity $\frac{3}{8}$ in.
R. P. M. 500-1000-2000
Spindle to Bed 14 in.
Spindle to Column 7 in.
Table 14x14 in.
Weight 225 lbs.

—
Chain Driven Spindle
for $\frac{3}{4}$ in. Drill.



The Taylor & Fenn Co.
Hartford, Conn.



FEATURES

Quick
Change Speed
Change in 2 seconds

Most
Efficient Drive
No belt troubles

Safety First
All parts protected

Heaviest
Drill Made
Yet very sensitive

All Ball Bearings



Note The Telescopic Screw

You don't have to bore holes through the floor to set up

The Sipp Quick - Change - Speed Drill

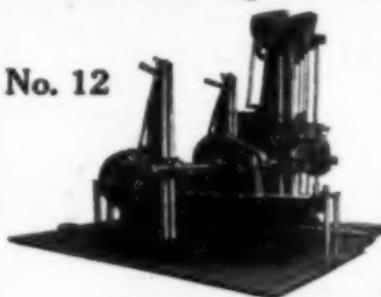
Cleanly, too, for base has elevated bead around it and elevated bosses for screws, which prevent oil from getting on the floor.

Write for full description of these and other features in Bulletin No. 4

The Sipp Machine Company
Keen St., Paterson, N. J.

P. & H. Drilling and Boring Machine

No. 12



1. Rapid traverse in each direction can readily be manipulated by slight adjustments on the hand wheel.

2. The spindle speeds are obtained by quick change gears and variable speed motor for either A. C. or D. C. current resulting in the following speed variations:

A. C. Current, 12 to 542 R. P. M.

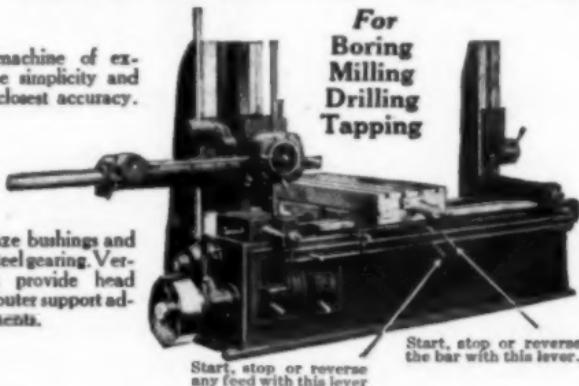
D. C. Current, 10 to 445 R. P. M.

3. The four changes of feed available for each speed are made by the operator without leaving his position near front end of spindle.

Pawling & Harnischfeger Company
Milwaukee, Wisconsin

THE LAMBERT Horizontal Boring Machine

A machine of extreme simplicity and the closest accuracy.



Bronze bushings and all-steel gearing. Verniers provide head and outer support adjustments.

The Lambert Machine & Engineering Company
Cleveland, Ohio, U. S. A.

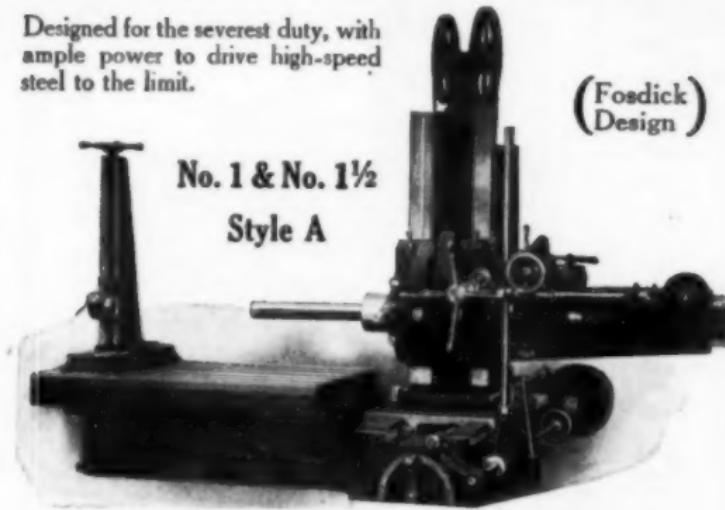
G. & L. Horizontal Boring Drilling and Milling Machines

Designed for the severest duty, with ample power to drive high-speed steel to the limit.

(Fosdick Design)

No. 1 & No. 1½

Style A



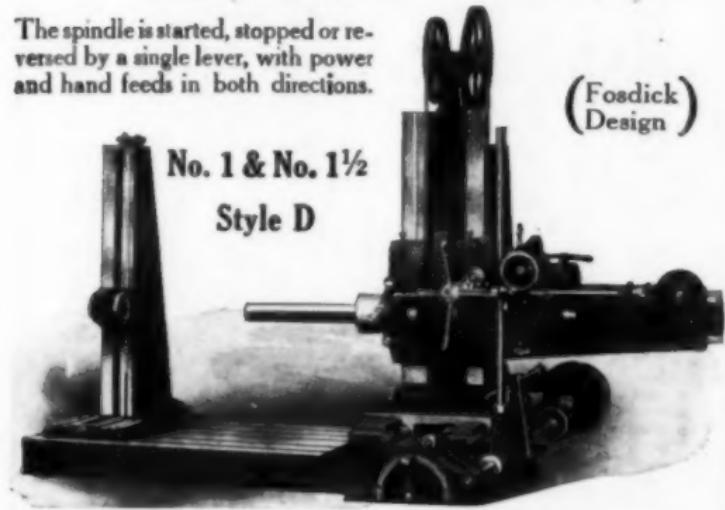
Either Style with 3½" or 4" Bar

The spindle is started, stopped or reversed by a single lever, with power and hand feeds in both directions.

(Fosdick Design)

No. 1 & No. 1½

Style D



Write for Full Details and Catalog

Giddings & Lewis Mfg. Co., Fond du Lac, Wis.

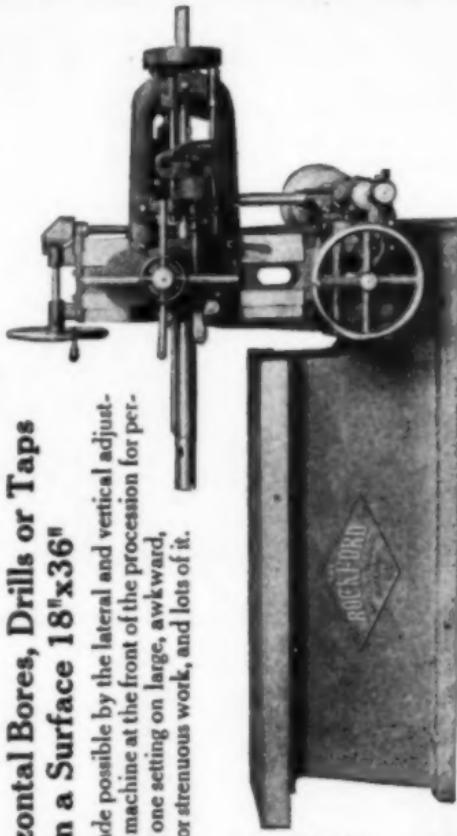
Facilitates Production of Heavy Work

The Rockford Horizontal Bores, Drills or Taps
Anywhere On a Surface 18" x 36"

This exceptional range is made possible by the lateral and vertical adjustment of the head, which places this machine at the front of the procession for performing a number of operations at one setting on large, awkward, hard-to-handle pieces. It is built for strenuous work, and lots of it.

Drives high speed drills up to 2" and bores up to 6" or over, according to feed used. It has the accuracy for the finest tool and jig work, and ample power for the hard jobs. There's a choice of six driving combinations.

An economy tool of the highest rank
Let us mail you the folder



THE ROCKFORD DRILLING MACHINE CO.,

Rockford, Illinois

Hammond High-Speed Sensitive Radial Drills

Minutes—even seconds count when you are doing light drilling and tapping. If your mechanics spend their time moving heavy parts each time they drill or tap a hole, they are cutting your production and profits.

With a "Hammond" they move the tool from place to place instantly—anywhere within a 48" circle. They move the tool and not the work. The operator's time is spent in production—not in doing laborer's work at mechanic's wages.

*Write and find out how you
can cut your light drilling
and tapping costs 25 to 33%*



**The Hammond Mfg. Co.
Cleveland, Ohio**

We have a complete line of
CASE HARDENING MATERIALS

"Hi Carbon" Pack Compound.

"B-G Compound" for Cyanide Hardening.

"Enamelite" for obtaining soft areas.

BOXES—POTS—OILS—BONE.

Shore's Scleroscope

In Stock

Prompt Service

Our complete catalog is waiting

Bell & Gossett Co.

613 W. 30th St.,

Chicago

Case Hardo

The Ideal Quick Case Hardening Compound

Eliminates dangers of operator being overcome by poisonous fumes.

Hardens quicker, cleaner and deeper than other agents.

Used the same as other agents, but at much lower heat.

The efficiency of CASE HARDO is fully guaranteed.

Write for information and prices

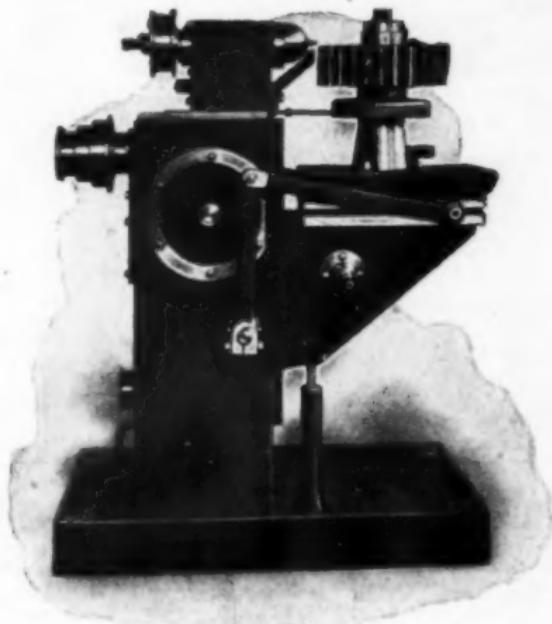
Manufactured Only By

The Thos. Buchanan Company

29 W. 3rd St., Cincinnati, Ohio

Established 1886

Makes the End of Each Tooth a Perfect Half-Circle



Rounds 24 Teeth Every Minute

This means quantity production, quality production, and low cost production. It means solving the problem of making sliding gears. It means that such gears, $\frac{1}{8}$ pitch or finer, will be perfect in shape, and will slide into mesh to the complete satisfaction of manufacturer and user.

**Let us show you why the Cross
is the machine you want**

Cross Gear & Engine Company
Detroit, Michigan

Patented here and abroad; sold ONLY by us

Armstrong Drop Forged Wrenches

Superior Design and Quality



All
Kinds



All
Sizes

Catalog free



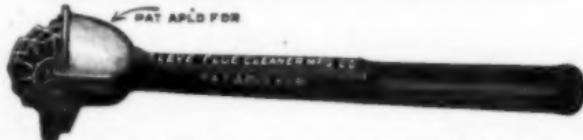
Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.

"Duplex" Emery Wheel Dresser

With "Diamond" Cutter for Large, Coarse Wheels or
"Improved" Cutter for Finer Work and General Use



The construction of the "Duplex" Handle is both simple and durable. No wrench is required for inserting new cutters. A detachable aluminum hood fully protects the operator against flying particles.

With either "Diamond" or "Improved" Cutters the "Duplex" Emery Wheel Dresser is safe, efficient, economical and durable.

Glad to send on trial—just say the word

Cleveland Flue Cleaner Mfg. Co.
321 Frankfort Ave., N. W., Cleveland, Ohio



The "Racine".

The Original, High Speed, Automatic
Positive Lift, Draw Cut
Metal Cutting Machine

Our line is complete—30 different types. Advise us of your requirements and we will quote on a machine suitable for your work.

Catalog "H" gives full particulars.

Racine Tool & Machine Co.
Racine, Wisconsin, U. S. A.
Use "RACINE" H-S Tungsten Power Blades

Saves Material At Every Cut

Cuts Hardened Steel Rods or Bars, Reamers,
Taps, Copper and Brass Tubing, Aluminum,
Etc., Quickly, Smoothly and Without Waste

Peter Bros. Ball Bearing Abrasive Cutter

The thin abrasive cutting wheel saves expensive material; it cuts so smoothly that no grinding is necessary; it cuts so rapidly that it saves time, and it doesn't draw the temper. Soon pays its own cost.

8" Size \$17.50, with C. S.
Splendid for tool room. Cuts
high-speed steel up to $\frac{1}{2}$ " square.

12" Size \$50, with C. S.
Cuts up to $2\frac{1}{2}$ " diameter,
round or square, at any angle
up to 45 degrees. Ball bearing.

15 Days' Free Trial

Write us or ask your dealer

PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.



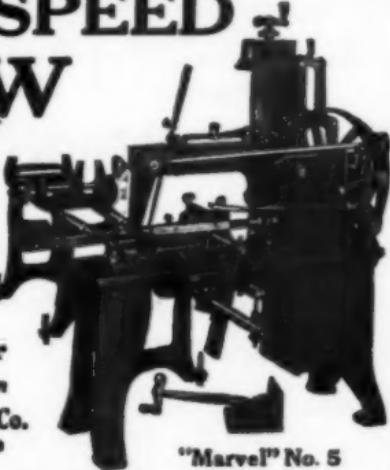
AUTOMATIC HIGH SPEED SAW

Attention is invited to
the "Marvel" No. 5
Cuts duplicate pieces
faster and at less cost
than any other
method. Entirely
automatic.

Feeds the Bar

Write for full information

Armstrong-Blum Mfg. Co.
341 N. Francisco Avenue
Chicago, Ill.



"Marvel" No. 5

Peerless

HIGH
SPEED

The New Standard of Production

Why Not Cut Off Stock
From 50 to 100% Faster?



Is there any reason why you should not profit by the superior speed, accuracy and capacity of the Peerless, as well as others? Why you should not do more work with the same number of machines, or the same work with fewer machines? Why you, also, should not save in room, in operating expense and in costly material?

We will prove to you what the Peerless is doing in some of the largest plants in the country, or will let you prove its superiority in your own plant. A machine is ready for you to try, and if after 30 days' use you want to let it go, you may ship it back at our cost for freight both ways.

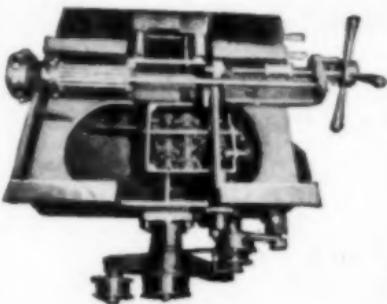
Write us about it, now

Peerless Machine Company

1609 Racine Street,

RACINE, WISCONSIN

**Get Better Results From Your
Jones & Lamson Friction Feed Turret Lathes**



Our New Gear Feed
gives the same results
as a built-in feed. It
is easy to install, or
we will install at cost
and repair or rebuild
your Jones & Lamson
Turret Lathes.

The best proof
of its practical effi-
ciency lies in the fact
that most of our busi-
ness comes from re-
peat orders.

Better get in touch with us. Glad to show you.

A. V. Wiggins & Co., Dept. H
384 W. Fayette St., Syracuse, N. Y.

Pulleys—Metal
Pulleys—Wood
Hangers—all kinds
Couplings—all kinds

At One-half Cost of New

Let us know your needs

Louis E. Rechtin & Bro.
215-219 Butler St., Cincinnati, Ohio

Redface Pulleys



Sheaves and Fly Wheels



PERMANENT: They are permanent, as they are not affected by age, heat, cold or moisture.

RELIABLE: They do not loosen up under vibration or intermittent loading.

RUN TRUE: They run true, steady the line shaft, and have a very small load due to windage.

REDFACE PULLEYS are especially adapted to use on motors, fans, pumps and special machinery.

Catalog mailed promptly upon request

Pyott Foundry Co.

Cast Iron Pulleys, Sheaves and Fly Wheels

328 N. Sangamon St.,

Chicago, Ill.

Cantons Cut Labor Bills



Portable Cranes Save Time and Money

"Canton" means satisfactory and profitable crane service. Instead of 6 to 10 men straining and sweating to move a machine or casting, one man with a Canton Crane does it easily, and in perfect safety.

It puts money in the proprietor's pocket, and safeguards the men from accidents.

*Your choice of many sizes
Booklet E-8 tells you all about them*

CANTON FOUNDRY & MCHE. CO., Canton, O.

ELECTRIC **EUCLID** HOISTS

Let OUR Engineers Save YOUR Time

It is possible that you realize the need of modern material handling equipment but cannot spare the time or men to work out the details.

Our engineers are constantly solving these difficulties and helping manufacturers reduce expenses.

Furthermore, this service is absolutely free.

Will you take advantage of it?

The Euclid Crane & Hoist Co.
Dept. C EUCLID, OHIO, U. S. A.

Modern Methods for Quick Work



A DAVIS KEYSEATER

Motor driven,
will save you
valuable space
as well as in-
crease your pro-
duction. It is
an investment
you can't afford
to overlook.

Write for Circular

DAVIS MACHINE TOOL CO., Inc.
ROCHESTER, N. Y., U. S. A.

The Anderson Improved
Ever-Ready Balancing Ways



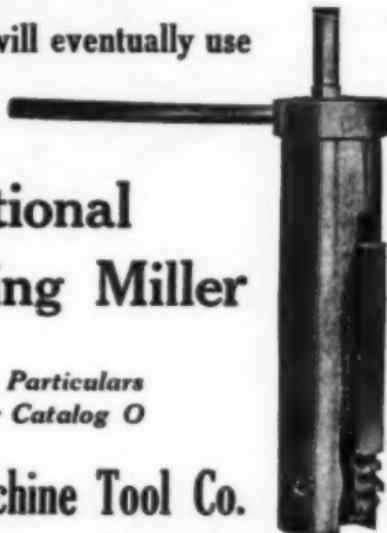
They have no superior for quick and accurate balancing of cutter heads, armatures, polishing wheels, aeroplane motors, propellers, crank shafts, cones, pulleys, turbine rotors, etc.

The rotating discs are made of chilled iron, ground true on face and perfectly balanced. They run in especially designed ball bearings and are extremely sensitive.

Several sizes—all reliable. Specifications and prices on request.

Anderson Bros. Mfg. Co.
115 Morgan St., Rockford, Ill.

The Tool you will eventually use



**The National
Keyseating Miller**

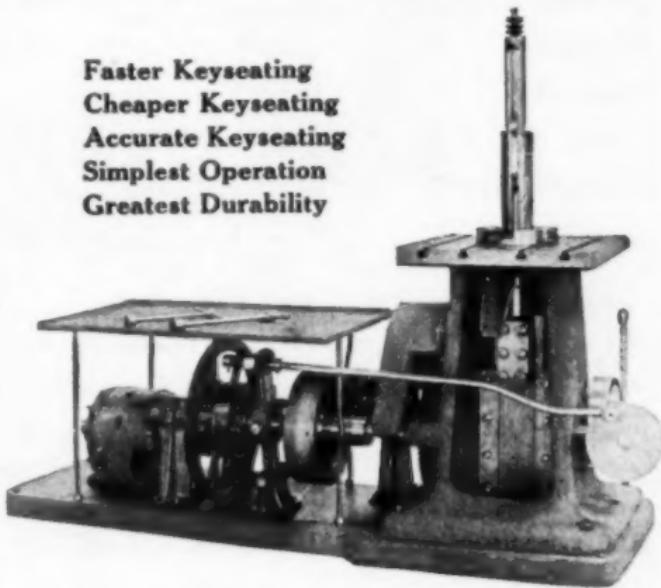
*For Full Particulars
Write for Catalog O*

National Machine Tool Co.

2266 Spring Grove Ave., Cincinnati, O.

What You Get With The Catlin Key-Seater

Faster Keyseating
Cheaper Keyseating
Accurate Keyseating
Simplest Operation
Greatest Durability



The "Catlin" has less than half the parts of any other make, enabling us to produce a machine which is much more substantial without being clumsy.

The operation is simple, rapid and accurate. The work is instantly and exactly centered by the bore, and the keyseat is accurately cut with proper taper, whether hubs are finished or not. This enables duplicate keyseats to be cut to one-thousandth of an inch without special tools or special skill. Hubs do not even have to be faced.

The "Catlin" is being used with splendid success in government shops, automobile factories, navy yards, and nearly every class of machine shops in this and many foreign countries.

The large folder shows clearly its construction and operation. May we send you a copy?

Chattanooga Machinery Company
Chattanooga, Tenn.

More Production

Dickow's
10-Inch
Universal
Index
Centers



Patents Pending

PROMPT DELIVERY

For Accuracy Get Dickow's

Sold by dealers. Write us today.

Fred. C. Dickow, 35 So. Desplaines St., Chicago, Ill.

Fenn No.1 Gear Cutter Grinder

Saves time because it requires but thirty seconds to change from grinding a 40 pitch cutter to 3 pitch cutter.

Self-contained motor and cord attached. Take it under your arm to any bench in the shop; connect to 110 volt A. C. lamp socket; you will find the machine will do many grinding jobs besides cutters. It is also O. K. for cutting off small brass tubing.



Fenn Manufacturing Company
Hartford, Conn.

W. A. FENN

Cable Address "Fenn"—Western Union Code

W. L. FENN



*Yearly
Losses
in
Tools
Saved*

You can write indelibly on steel

even when hardened, just as easy as with
a pencil on paper, by means of

THE ELECTRO-STYLOGRAPH

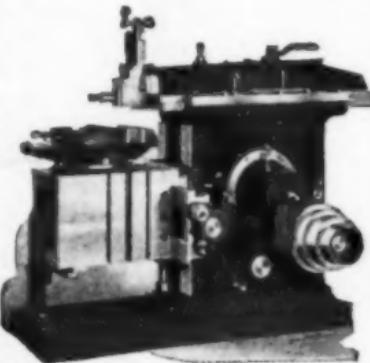
Very useful for permanent marking of tools,
gages, dies, metallurgical test specimens, etc.

THE ELECTRO-STYLOGRAPH CO.
2 EAST 24TH STREET, NEW YORK

COLUMBIA HEAVY DUTY SHAPERS

Have quick-change feed that is a real convenience. Eight feed changes easily and quickly made and direction of feed controlled while machine is running, by two levers, both convenient to operator's hand. Feed cannot operate against the cut—a safe-guard against spoiled work. All parts enclosed, yet easily accessible if necessary.

Let us send you printed matter describing this and other features in detail. Sizes 16", 20", 24" and 28".



The Columbia Machine Tool Company
Hamilton, Ohio

Pulls More and Saves Power

The National Clutch makes good in all industries



The pull is directly on the Friction Wedge Plates; all wood, fibre or other substances are eliminated.

Extremely powerful in operation, it engages with utmost ease and disengages instantly. No springs or weak parts to get out of order. Used successfully on machine tools, mining machinery, cement mills, woodworking and agricultural machinery. Made in any size from 2 in. up.

Glad to submit complete data and make estimates

National Clutch Company
1859 Fulton St., Chicago, Ill.

The Rhodes Shaper

7½ in. Horizontal } In Combination
3½ in. Vertical } Or Separate

Furnished in both the floor and bench type



THE RHODES Improved Combination Shaper has all the essential features of the larger and therefore more expensive machines, and it is even more efficient and economical for the machining of work within its capacity, because it is lighter running and easier to handle.

There isn't a better machine made for the rapid and accurate shaping and slotting of all kinds of light work, including dies, tools, models, etc., than the Rhodes Improved, and it is sold at a price which you can well afford to pay.

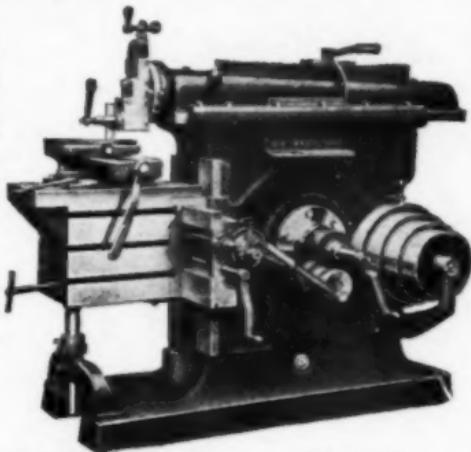
Will you give us the chance to show you?

Rhodes Mfg. Company
Hartford, Conn.

SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Geared
Crank,
Single Pul-
ley Drive.



The Smith & Mills Co. Station B., Cincinnati, O., U.S.A.

Shapers

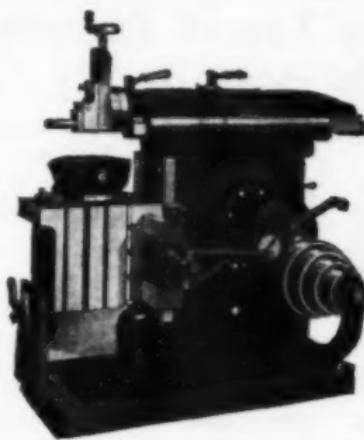
The best medium
priced Shaper on
the market.

Built in 16", 18",
and 24" sizes, all
back geared crank
machines.

A few for early
delivery.



The Osborne & Sexton Mchy. Co.
Columbus, Ohio



Steptoe Shapers and Millers

are the product of seventy-four years
of experience in the manufacture of

High Grade Machine Tools

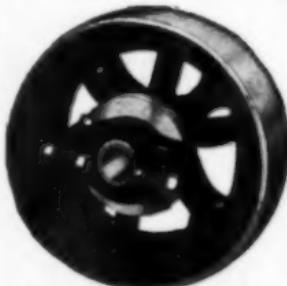
Thousands of our machines in shops
giving daily satisfaction are a recom-
mendation for our product which should
not be overlooked
when buying shapers
and milling machines.

*We will be glad to send
catalogues on request*

—The—
John Steptoe Co.
Stock Yards Station.
Cincinnati, Ohio



The Longest Lived Clutch That Can Be Bought



Self-oiling—double adjustment—
double gripping power.

There is no better service
anywhere than the

Carroll Clutch Service

They are guaranteed against re-
pair, for the life of the machine
they drive, and are moderately
priced. Used by many Ma-
chine Tool Builders because
they have proven their worth.

To use them is economy. May we serve you?

L. W. Carroll Manufacturing Co.
Batavia, Ohio

The Tried and Proven EDGEMONT The Clutch That Holds and Lasts



Enclosed Type, Self-Oiling

Men who make machines to make
other machines, whose products
are foundation stones for many
other industries, use only clutches
of demonstrated reliability—dem-
onstrated by years and years of
dependable service. When ma-
chine tool builders select the
Edgemont for their machines—
we can send you a long list of those
who do—it speaks volumes for the
efficiency and reliability of this
clutch. It is free from springs and
delicate parts, is smooth and easy
in action and transmits reliably
the full power of the belt.

Don't you want as good a clutch on your machine?

The Edgemont Machine Co.
Dayton, Ohio

Special Clutches and Transmission Machinery for all purposes.

LAST summer, America expected a long war. She prepared for it, and prepared so tremendously that the knowledge of what America was doing broke the spirit of the German resistance.

The war collapsed.

But those preparations must be paid for. Such a sudden victory is expensive in money, ***but a slower victory would have cost the lives of thousands more of America's boys,*** and even more treasure.

Americans will show their gratitude by helping to pay for those preparations.

The money for the Victory Liberty Loan will pay the bills.

How much will you subscribe?

Subscribe to the **Victory Liberty Loan**

Space contributed by
A. H. HITCHCOCK, Publisher
Prepared By American Association of Advertising Agencies

Underwood's Portable Miller

For Railway and General Repair Shops

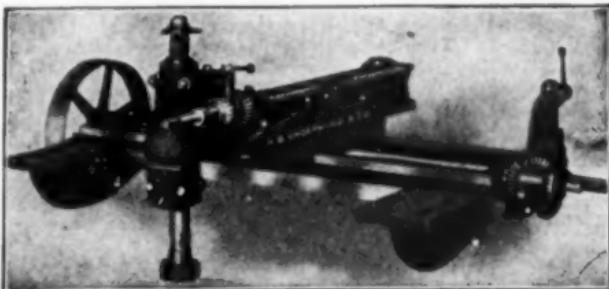


Figure 110

THIS EXCEPTIONALLY handy and efficient tool is cutting time in two in railway and general repair shops. It has power feed in both directions, and is usable in any position—horizontal, vertical or inclined—making it easy to do a wide range of repairing *in place*.

It faces a valve seat $22 \times 40 \times 7$ in., or does other milling of similar dimensions. Gives universal satisfaction because of its rapid and accurate work. We can build to suit your special requirements. Operated by hand, small steam engine, air or electric motor.

Our comprehensive line of Portable Tools includes:

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; armature and axle bearing borers; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders, motors, etc.

We've been making 'em for nearly 50 years—Send for our Catalog

H. B. Underwood Corporation

1016-22 Buttonwood St., Philadelphia, Pa.

Second-Hand Machinery.

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue. Minimum charge, **\$4.00**. Sub-headings are counted as one line, but the name and address of advertiser are not included in the space charged for. No display in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you require is not listed, use the blank enclosed to make known your wants to the publisher.

FOR SALE BY

Badger-Packard Mch'y. Co., 133-139 W. Water St., Milwaukee, Wis.

LATHES.

12"x6' Seneca Falls Star, q. c.
24"x8' Pond, l. c. g., 5-st. c., s. b. g.
16"x8' Fifield, loose chg., s.b.g., 4-st.c.

MISCELLANEOUS.

Air compressor, 8"x8" class N-SB Chicago horizontal.
Chucking and turning mchs., Potter & Johnston automatic.
Drill, 24" sliding hd. Sibley, b. g., p.f.
Exhaustor, planing mill, No. 40 Sturtevant, slow speed.
Feed water heater, 24"x6" 8" open pattern.
Grinder, No. 1½ Cincinnati universal tool and cutter.
Grinder, 72" Holmes auto. knife.
Grinder, 10"x20" Landis universal with equipment.
Grinder, No. 3 Oesterlein "Ohio" universal and tool.
Hammer, Star upright power, 35 lb.
Planer, 24"x24"x16' Fitchburg.

24"x16' old type, loose change gear,
4 s. c., s. b. g.
24" Pond rigid turret lathe.

Miller, 13"x50" Hendey Lincoln type, 1½" arbor and c. s.
Oven furnace, No. 1 Stewart, with blower.
Oven furnace No. 27 Stewart, without blower.
Punch, style M Badger, rapid action, 6" throat, 1½"x3½" cap.
Purifier, 30"x6" Buffalo, closed pattern.
Rivet spinning machine, Grant, 110 v., d. c. motor driven, 3/16" cap.
Screw machine, 1½" Cleveland auto.
Screw mch., 2½"x1½" Pratt & Whitney auto., with c. s.
Screw mch., 1½"x17" Hartford auto.
Steam pump, 5"x2½"x6" Whittier duplex.

FOR SALE BY

W. J. Baird Machinery Co., 265 Jefferson Ave., Detroit, Mich.

Boring mill, Lambert horizontal, new.
Broaching machine, No. 2 J. N. Lapointe, new.
Engine lathes, 14"x6" Carroll-Jamieson, new, (3).
Engine lathes, 25"x12" Sidney, new, (2).
Grinder, No. 2 Fraser universal, self-contained, new.
Grinder, No. 2 Fraser universal, detached countershaft, new.
Grinder, No. 2 Bath universal, used.
Grinders, No. 1 Wilmarth & Morman universal, new, (3).
Grinder, No. 2 Wilmarth & Morman automatic, surface, new.
Grinder, No. 3 Wilmarth & Morman, wet surface.
Lathe, tool room, 16"x6" Rockford, new.
Lathe, tool room, 16"x8" Rockford, new.
Miller, No. 2 Rockford universal, high-powered, all geared, new.
Miller, No. 2½ Rockford universal, d. b. g., cone type, new.
Miller, No. 2½ Rockford universal, high-powered, all geared, new.
Planer, 22"x22"x5' Wheeler, used.
Planer, 42"x42"x10' Davis & Egan, used.
Punch press, No. 5 Loshbough-Jordan, open back inclinable, new.
Punch press, No. 5 Loshbough-Jordan, open back, inc., (not geared) new.
Screw machine, 1" National Acme, 4-spindle, automatic.
Screw machine, 1½" 5-hole Cleveland, automatic.
Shaper, 16" Milwaukee, back geared, new.
Shaper 16" Queen City, back geared, new.

SECOND-HAND MACHINERY

FOR SALE BY

**McCoy-Brandt Machinery Company
Office and Warehouse, 210-218 Penn Ave., Pittsburgh, Pa.**

NEW EQUIPMENT.

LATHES.

27" x 18' Sidney, q. c. g. d. b. g.	15" x 6' Sidney, q. c. s. b. g.
25" x 16' Sidney, q. c. g. d. b. g.	18" x 10' South Bend, s. b. g., cone.
19" x 14' Sidney, q. c. d. b. g.	16" x 6' South Bend, s. b. g., cone.
19" x 12' Sidney, q. c. d. b. g.	13" x 4' South Bend, c. r., h. s.
19" x 10' Sidney, q. c. d. b. g.	14" x 6' Filsmith, semi-q. c., cone.
17" x 10' Sidney, q. c. d. b. g.	16" x 6' Filsmith, q. c., d. b. g., cone.
15" x 10' Sidney, q. c. d. b. g.	10" x 4' Climax, s. b. g., cone.

MILLING MACHINES.

No. 1½ American, geared, plain.	No. 1 Bickett pl hand, table 5½" x 24".
10" x 26" Bristol, vertical, with 13" rotary table.	No. 0 Bickett vertical profiler, table 7" x 10".
No. 1 U. S. pl. hand, table 6½" x 23".	No. 2 Cleveland universal.

DRILL PRESSES.

25" Weigel, sliding head.	14" Excelsior, sens., 2 tables, (4).
25" Silver, sliding head, geared, (3).	10" Burke sen. bench cap. 5/16", (5).
20" Silver, plain or geared, (18).	9" Western Chief, bench, 1", (8).

POWER METAL SAWS.

Peerless, capacity 13" x 16" motor bracket, with speed box.	Peerless, cap. 6" x 6" belted.
Peerless, capacity 9x9", belted.	Economy, 6" x 6" belted, No. 2.

ARBOR PRESSES.

No. 3 Greenerd, (3).	No. 5 Greenerd, with stand.
No. 3-A Greenerd, (4).	No. 15 Greenerd, with stand.
No. 3½ Greenerd, with stands, (2).	

GRINDERS AND BUFFERS.

No. 2 Woods universal tool & cutter.	14" x 4" W. & P. gr. and pol., No. 1½ T.
18" x 2" Webster & Perks wet tool.	No. 0 W. & P. pol. & bf'ng la's. (3).
No. 4 W. & P. polish. & buf. lathe.	12" Patch, double end, with col.
10" Patch, dbl. end, with col., (3).	18" Patch, double end, with col.

MISCELLANEOUS.

Hammers, 50 & 100 lb. Little Giant.	Shaper, 28" Queen City, crank, grd.
Press, No. 4 Garrison, o. b. i. 2" str.	Shapers, 18", 21" & 24" Hollingsworth, crank, geared.
Shaper, 24" Kelly, crank, geared.	

USED EQUIPMENT.

BOLT CUTTERS.

1" Acme, double-head, with motor.	1½" Acme, sgl. hd., pump & pan, (2).
1½" Acme, dbl.-hd., oil pump, pan.	Nut tapper, 2-spdl. Acme, 1½", pan.

DRILLING MACHINES.

Radial, 36" Bickford, plain.	24" Barnes, plain, sliding head.
Multiple 8-spindle Foote-Burt.	24" Cincinnati, pwr id., sliding hd.
20" Baker heavy duty, power feed.	28" Back geared, power feed, spdl.
24" Colburn hvy. duty, No. 4 Morse.	1-3/16" hole.

LATHES—TURRET.

3x36" J. & L., bar and chk'g. equip.	B. & S. 1½" h.s., 7-hole round turret,
3x36" J. & L., bar equipment.	9" box chuck.
No. 4 W. & S. w. l., 6-hole round turret.	24" x 12" Johnson, 6-hole turret.
2½" Garvin, 6-hole hexagon turret,	16" American Fox, 6-h. turret.
12" box chuck.	16" x 6" Reed, tur. on shears.

GRINDERS.

12" Bridgeport, cupwheel, knife.	No. 13 Brown & Sharpe universal & tool, auto. feed.
B. & S. plain, 12x12", auto. feed.	
Bath univ. tool & cutter, 14x40".	

MILLING MACHINES.

No. 1 B. & S. plain, hand feed.	No. 3 B. & S. universal, 12" index head, table 10x50".
No. 3 Cincinnati plain, q. c. g.	

SECOND-HAND MACHINERY

McCoy-Brandt Machinery Company—Continued. USED EQUIPMENT.

LATHES.

- 48" Niles car wheel turning, journal attachment, m. d.
 46"x25' (centers) Fifield triple geared.
 42"x24' Fifield triple geared.
 42"x20' Niles boring lathe.
 26" Lodge & Shipley wheel or pulley lathe.
 28"x14' R. M. & C., h. s., c. r., t. a., 24" 4-jaw chuck.
 24"x15' New Haven, h. s., c. r.
 24"x15' Fifield, solid spindle, plain rest.
 24"x12' S. B. & E., 5" raising blocks, h. s., c. r., 18" 4-jaw chuck.
 18"x10' Rockford, q. c. g., h. s., c. r.
 16"x8' Johnson, a. b. g., c. r., solid spindle.
 16"x 8' Prentice, c. r., h. s., 12" 4-jaw chuck.
 16"x 6' Prentice, h. s., c. r., 12" 4-jaw chuck.
 16"x6' Johnson, a. b. g., c. r., solid spindle.
 16"x 6' R. M. & C., h. s., c. r., 12" 4-jaw chuck.
 16"x 6' LeBlond, h. s., c. r., 12" 4-jaw chuck.
 Speed lathes, 17", 15", 13"—4' bed.

MOTORS AND GENERATORS.

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| 30 & 20 h. p., 3-60-220 v.
10 h. p., Fairbanks, 2-60-440 v.
1 h. p., 2-60—220 v., 1500 rev.
10 & 4½ h. p., series wd., 220 v., d. c. | 7½ h.p. Triumph, 220 v., d.c., elev. duty
15 h. p. G. E., 500 v., d. c.
90 k. v. a. Lincoln, 3-60-220 v. |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|

PRESSES AND BRAKES.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. 25 Niagara, arch, 24" str., 3200 lbs.
Perkins punch, 2" stroke, 4,500 lbs.
No. 4 Stiles, 1½" str., 5,000 lbs., pl.
No. 65 Spe'y Toledo (cam), 7 & 4" str.
Punch press, Bliss geared, 8,500 lbs.
No. 6½-A Perkins sgl. cr., grd., 2" str. | Consolidated, geared, 4" stroke.
Waterbury Farrel, geared, str. 8".
13' 6" Garrison brake or press, cap.
4", weight 118,000 lbs.
8' Robison hand brake, cap. 16 ga. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

PUMPS.

- | | |
|----------------------------------------------------------|----------------------------------------------------------------|
| 3½"x24" Deane deep well, 25 g. p. m.
for motor drive. | 3½"x10" Deane triplex, belted.
7x5x10" Hall, duplex, steam. |
|----------------------------------------------------------|----------------------------------------------------------------|

PUNCHES, SHEARS AND ROLLS.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15" throat, sgle., cap. 4x1" arch jaw.
15" throat, double, capacity 1½x1".
Williams-White No. 13.
14" throat, double, capacity 2½"x1½".
No. 11 Williams-White.
Guillotine shear, capacity 18" rounds,
Hilles & Jones.
Guillotine shear, No. 3 Wilder, cap.
1, 1½" stroke.
Guillotine shear, No. 3 Cleveland,
3½" stroke, capacity 2" sq.
30" thrt., sgl., cap. 1½x1" Cincinnati. | Guillotine shear, No. 5 Cleveland,
3" stroke, capacity 2½" sq.
Guillotine shear, Cleveland, 3" stroke,
capacity, 2" square.
Slitting shear, rotary, 23" throat,
capacity 2", Newbold.
Slitting shear, rotary, 8" throat, cap.
3/16"; 18" throat, cap. 1".
Bevel shear, Thompson, rated cap. 4".
Squaring shear, 10", capacity 4".
Squaring shear, 26" pwr., cap. 16 ga.
Rolls, 10' Bertsch, cap. 14" gauge. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

SHAPERS AND PLANERS.

- | | |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 24" Cincinnati, crank, b. g., vise.
24" Queen City, crank, b. g., vise.
30"x30"x8' Gray, 1 head. | 20" Cincinnati, crank, d. b. g., vise.
20" Steptoe, crank, s. b. g., vise. |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|

STEAM HAMMERS.

- | | |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1000 lb. N.-B.-P. dble. frame, (4).
700 lb. N.-B.-P. dble. frame, (6). | 700 lb. Pittsburgh, dble. frame, (3).
600 lb. Morgan, double frame, (7). |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------|

MISCELLANEOUS.

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Boring mill, No. 1 Sellers horizontal,
2½" bar.
Bulldozers, Nos. 6 and 7 W.-W.
Chucks, for lathes and millers, new.
Compressors, 9x5x10" Westinghouse
steam, (2).
Cutting-off mch., 8" Brightman.
Gear planer, 12" Gleason. | Pipe mch., 8" E. C. & B., dies, en-
gine driven.
Pipe machine, 12" Curtis & Curtis,
engine driven.
Riveter, 8" Shuster.
Seamer, 30" dbl. P. S. & W., hand.
Tooth rounder, 12" Ingle. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

SECOND-HAND MACHINERY

FOR SALE BY

J. J. McCabe Lathe & Mchy. Corporation, 149 Broadway, New York

NEW LATHES ABSOLUTELY IN STOCK.

16" x 6'.
16" x 8'.
16" x 10'.
18" x 10'.
18" x 12'.
18" x 14'.

21" x 10'.
21" x 12'.
21" x 14'.
26" x 16'.
29" x 18'.
29" x 20'.

LATHES (USED).

102" swing, 40' bed, Putnam.
69" swing, 26' bed, New Haven.
36" swing, 20' bed, Fitchburg.
36" swing, 16' bed, Putnam.
30" swing, 14' bed, Bement.

26/48" swing, 20' bed, McCabe, dbl. spindle.
24" swing, 15' bed, Bement.
24" swing, 10' bed, New Haven.
17" swing, 8' bed, Bridgeford.

NEW PLANER TYPE MILLING MACHINE.

52" in width between housings, 48" in height under crossrail, table 16' in length inside pockets, with four (4) heads—two vert. heads on crossrail and two horizontal heads, one on each housing, complete with countershaft or arranged for motor drive. Equipped with a number of improved features not found on any other planer type milling machine built.

CRANK-MOTION SHAPERS (NEW).

12" stroke, plain, (4).
14" stroke, plain, (6).
20" stroke, back geared, (6).

25" stroke, back geared, (3).
28" speed-box, sgl. pulley drive, (3).
32" speed-box, sgl. pulley drive, (4).

RADIAL DRILLS (NEW).

21" speed-box, tapping att., (6).
21" cone drive, tapping att., (2).
3" speedy sen. type, tapping att., (2).

38" speed-box, tapping att., (3).
4" speed-box, tapping att., (5).

TURRET LATHES (USED).

28" rigid type, 4" hole, rapid trav.
21" Gisholt gap style, 14" hol. spdl.

20" Potter & Johnston, 2" hol. spdl.
3x36" flat turret, Jones & L., grd.hd.

BORING MACHINES (USED).

Horizontal 3" bar Fitchburg.
Upright, 36" Brown & S., tur. hd.

Carwheel borer, 42" Bement Miles.
Carwheel borer, 54" Niles.

OTHER TOOLS (USED).

Boring bar, 43" diam., 8' 6" long, with sliding head and inserted screw.
Cold saw, 12" blade, Higley.
Cold saw, 28" blade, Espen-Lucas.
Cutting-off mach., 10" cap., Bement.
Drop hammer, 800 lb., Williams & W.
Gas engine, 15 h. p., Fairbanks-M.

Hydraulic press, 150 tons cap., for pressing in bushings.
Nut tapper, 6-spindle, Acme.
Shaft straightener, up to 48" dia., 25' in length, Medart.
Steam engines, 1 horiz., 1 vertical.

PLANERS (USED).

54" x 12' Pond, 4 heads.
42" x 9' New Haven, 1 head.
36" x 36" x 10' Woodward Powell.

30" x 6' Pond, 1 head.
24" x 6' Gray, 1 head.
24" x 8' Woodward-Powell, 1 head

GRINDERS (USED).

Universal, 12" x 66" Landis.
Universal, 12" x 36" Iroquois.
Planer type surface, 26" between housings, 8' table, Springfield.

Heavy roll grinder.
Plain grinder, 10" x 30", Bridgeport.
Small grinders, varied assortment

MILLING MACHINES (USED).

Cincinnati No. 3, pln., tables 52" x 12", longitudinal feed 34", (7).
Brainerd, pl.,tbl. 48" long, 14" w., (2).

Newton horiz. & vert.hd.,tbl. 60x12".
Lincoln type, tables 28" x 7", (10).
New planer type milling machine.

DRILLS (USED).

Radial, 24" arm, Fosdick.

Four spindle Niles, table 8' long.

GEAR CUTTERS (USED).

Gear planer, 24" Gleason, complete.

SHAPERS (USED).

12-14-16 and 20" stroke, various makes.

HYDRAULIC RIVETER (USED).

Chambersburg Bull 8' gap with overhead crane, hoist, accumulator, pump and complete outfit—still set up as used.

SECOND-HAND MACHINERY

J. J. McCabe Lathe & Mchy. Corporation—Continued.

AIR RIVETER (USED).

"Albree type" portable style, 19" gap cylinder, 12"x12", cap. 1 $\frac{1}{2}$ " rivets.

PUNCHES AND SHEARS (USED).

Shear, 36" tht., cap. about 4" plate. | Punch, 14" throat, 4" capacity.
Bevel shrs., Lennox rotary, 4" plate. | Punch, portable, Pels.

BENDING ROLLS (USED).

Wickes Bros., 14' 2" between housings, top roll 14" diameter counterbalanced, raised and lowered by power. Lower rolls 10" diameter. Drop-end housing. Motor drive, with motor and controller complete.
Standard pattern, 8' 9" between housings. Top roll 11" diameter. Lower rolls 9". Belt drive.

HORIZONTAL PUNCH (USED).

Hilles & Jones, 60" gap. Capacity 3 $\frac{1}{2}$ " hole thru 1" plate. Weight 68,000 lbs Arranged for motor—no motor.

FOR SALE BY

Federal Machinery Sales Company,

8 N. Jefferson St., Chicago, Ill. 212 Sycamore St., Milwaukee, Wis.

USED and NEW Tools.—Immediate shipment. .

DRILLING MACHINES.

New Silver 20" stationary head drills, (6).

New Cleveland 36" sliding head drill, b. g., p. f.

New Snyder 28" sliding head drill, b. g., p. f.

New Henry & Wright 1, 2, 3, 4 and 6-spindle ball bearing drills, (20).

New 3' Mueller heavy plain radial drill.

Used 5' Bickford full universal radial, s. p., gear box drive.

GEAR SHAPERS.

Used 24" Fellows gear shaper. | Used 36" Fellows gear shaper.

GRINDERS.

New No. 1 Grand Rapids universal cutter and tool grinder.

New No. 2 Gardner ball bearing disc grinder.

LATHES.

New Dalton type B-4, 6"x36" bench lathes on legs, (6).

Used Prentice 16"x6" standard engine lathe.

New Oliver 16"x7" q. c. g. engine lathe.

Used Flather 17"x8" q. c. g. engine lathe.

New National 17"x8" q. c. g. engine lathes, (2).

New Hollingsworth standard engine lathes, one with taper, (2).

New National 18"x8" q. c. g. engine lathes, (4).

New Reed 22"x13" engine lathe, s. b. g., h. s. c. r.

MILLING MACHINES.

Used No. 2 Cincinnati plain milling machine.

Used Carter & Hakes No. 2 Lincoln miller.

PLANER.

Used Enterprise 30"x30"x16" planer, one head.

PIPE MACHINE.

Used Victor, 4".

PRESSES.

New Nos. 18, 19, 20, 21 and 21-B Bliss o. b. i. presses.

New style C-3 Ferracute open back inclinable presses, (3).

SHEARS AND SAWS.

New Peck, Stow & Wilcox No. 137-A foot power squaring shear.

Used Ohl 10' power squaring shear, No. 12 gauge.

New No. 10 Racine 8"x8" hack saw.

SCREW MACHINES AND TURRET LATHES.

Used 14" Pierce turret lathe.

Used 14" Pierce universal Fox turret lathe.

Used 17"x8" Pierce plain head screw machine.

Used Bridgeport 20"x8" turret lathe.

New Nos. 1-2 and 4 Southworth screw machines, (6).

Above list is incomplete. Write us, giving specifications of anything required.

SECOND-HAND MACHINERY

FOR SALE BY

Dale-Brewster Machinery Co., Inc.,

541-7 W. Washington Blvd., Chicago; 54-60 Lafayette St., New York

In Stock At Chicago

NEW

ARBOR PRESSES.

Atlas—all sizes.

DRILLING MACHINES.

Dumore type C hand drills.

Dumore sensitive bench drill.

Wiley portable electric drills, various sizes.

Burke No. 1 bench drills, (6).

Demco No. 22 bench, (5).

Demco No. 30-A bench.

Demco No. 32-D, h. s., b. b. floor type, 1-spindle.

Demco No. 32-D, h. s., b. b. floor type, 2-spindle.

Demco No. 32-D, h. s., b. b. floor type, 3-spindle.

Detroit 1-spindle, h. s., b. b.

Detroit 2-spindle, h. s., b. b.

Stecher 10" bench drills, (6).

Champion 14" upright power drill.

U. S. 14" sensitive, floor type, (3).

Canedy-Otto 30" wheel and lever feed, (4).

Silver 20" wheel and lever feed, (2).

Canedy-Otto 20" b. g., p. f., (4).

Snyder 25" drills, (8).

Silver 25" sliding head.

Snyder 25" sliding head.

Snyder 25" sliding head, with tapping attachment.

Snyder 25" sliding head.

Snyder 30" sliding head.

Snyder 36" sliding head.

RADIAL DRILLS.

Western 3' manufacturing type.

Canedy-Otto 3½', (2).

GRINDERS.

Bodine bench, 110 volt, a. c.

Cleveland profile.

Grand Rapids A-1-T, drill.

Grand Rapids B-2-T, drill, (4).

Grand Rapids C-2-T, drill.

Grand Rapids C-3-T, drill, (4).

Grand Rapids D-4-T, drill.

Grand Rapids No. 1 universal.

Milwaukee 24" wet tool.

Modern No. 3 universal, (4).

Norton No. 1 universal.

Norton No. 2 universal.

Partridge grinders, all sizes.

Reid surface grinder.

Wells No. 190 universal.

Wilmarth & Morman JA point drill.

Wilmarth & Morman No. 3 surface.

Dumore junior grinders, 110 & 220 v.

Dumore grinders with equipment

"A", 110 and 220 volt.

LATHES.

Elgin 4x8 bench.

Dalton 6"x30" bench, (2).

Wells No. 100 speed 11"x4".

Cleveland "Stellar" 11", (2).

Cleveland 12"x 4'6" precision, (2).

Lancaster 13"x 6" engine.

Amtew 14"x 6" engine, (2).

Cisco 14"x 6" engine.

Chard 16"x 9" engine.

Cisco 18"x 8" engine.

Chard 18"x 9" engine, (4).

Chard 20"x 9" engine.

Chard 20"x11" engine.

Chard 24"x13" engine.

Wickes 26"x12" engine.

MILLING MACHINES.

Cleveland No. 2 universal, (5).

Cleveland, No. 2 plain, (2).

Fox No. 1-B plain, power feed.

Fox No. 2-B plain, power feed, (2).

Fox No. 3-A universal,

SAWS.

Marvel No. 1 hack saw.

Marvel No. 1 hack saw.

Peerless 6"x6" hack saw, (5).

Peerless 9"x9" hack saw, (2).

SCREW MACHINES.

Pierce 1"x8" heavy pattern, plain head turret.

SHAPERS.

Barker 16" back geared, crank shaper.

Walcott 24" high duty, crank shaper with power feed in head.

TINNERS' TOOLS.

Pexto tools, various types and sizes.

SECOND-HAND MACHINERY

Dale-Brewster Machinery Co., Inc.—Continued.

MISCELLANEOUS.

Dividing heads, 10" Simmons, (2).
Die filing machine, Barry No. 2.
Die filing machine, Nerco.
Die filing machine, Handy, motor driven.
Foot presses, Partridge, (3).

Gear hobber, No. 3 Farwell.
Punches and bench shears, Whitney.
Punch press, style B Rockford.
Punch press, No. 1 Rockford.
Punch press, No. 2 Rockford.
Punch press, No. 4 Rockford.

USED

Boring mill, 42" King.
Cold saw, Higley.
Drill, 26" Lodge & Davis.
Drilling and tap, mch., Murcley.

Grinder, Racine elec tool post.
Punch press, No. 5 Niagara.
Punch press, No. 2½ V. & O

FOR SALE BY

The O'Brien Machinery Co.,

Brake, 8' double truss.
Drill, 32" Aurora.
Drill, 26" Barnes.
Drill, Sipp, 1 spindle, high speed.
Drill, Sipp, 3 spindle, high speed.
Drill, Sipp, 4 spindle, high speed.
Grinders, Pratt & Whitney vertical surface, (2).
Grinder, Gisholt, cutter.
Lathe, 16"x6' Le Blond.
Lathe, 16"x9' Lehmann.
Lathes, new 18"x8' Rockford, (5).
Lathe, 18"x9' Lehmann.
Lathe, 20"x12' Le Blond.
Lathe, 24"x8' Davis, q. c. g., t. a.
Lathe, 24"x12' Hamilton.
Lathe, 26"x14' American.
Lathe, 26"-48"x14' McCabe dbl. sp.
Lathe, 85"x18' Bement.

119 N. Third St., Philadelphia, Pa.

Miller, No. 1 Dow plain.
Miller, No. 15 Garvin plain.
Miller, vertical, No. 3 Becker.
Planer, 24"x24"x 6' N. Y. Safety.
Press, Ferracute P-2.
Punch and shear, sgl. end new, cap. 4x flat, 1' rd, punch $\frac{1}{2}$ " in $\frac{1}{2}$ " iron.
Punch, single end, 32" throat, Hilles & Jones, cap. 1 $\frac{1}{2}$ " hole in 1 $\frac{1}{2}$ " iron, No. 4 type.
Punch and shear, dbl. end new, cap. punch, $\frac{1}{2}$ " in $\frac{1}{2}$ "; cap. shear, 1 $\frac{1}{2}$ rd, 1 $\frac{1}{2}$ x5" flat; weight 3,600.
Shaper, 12" Bement.
Shaper, 16" Smith & Mills, b. g.
Spinning lathe, 44" swing, hvy. duty.
Turret lathes, 3"x36" Jones & Lamson, flat (3).

FOR SALE BY

Chas. Molitor Machinery Co.,

Bulldozer, vertical, Coulter & McK.
Cock grinder, Foote-Burt, high sp., automatic vertical.
Corrugating machine, 10'.
Drills, 4-sp. Henry & W. H. sp., $\frac{1}{2}$ " cap.
Drill, 2-sp. Avey high speed, $\frac{1}{2}$ " cap.
Drill, 36" Hamilton, b. g., slid. hd.
Drill, 28" Hoefer, b. g., sliding head.
Drill, 24" American, b. g., slid. hd.
Grinder, 18"x9' Landis external.
Grinder, Safety Emery W. Co., horiz. auto. rotary, hvy.
Grinder, Safety Emery W. Co., vert. auto. rotary.
Lathe, engine, 36"x16' Putnam.
Lathe, engine, 36"x12' Prentiss, d.b.g.
Lathe, engine, 20"x10' Rahn-Larmon.

124 S. Clinton St., Chicago, Ill.

Special Bargains

Lathe, engine, 16"x6' Greaves-K.
Lathe, toolroom, 12"x8' Vernon, q. c. g.
Lathe, 15"x6' South Bend.
Lathe, 13"x6' Seneca Falls.
Lathe, Rivett bench, $\frac{1}{2}$ " cap., d. c. motor att.
Miller, No. 2 Cincinnati, plain.
Miller, No. 3 Cincinnati, plain.
Miller, No. 3 Hendey, plain.
Planer, 52"x16' Sellers, 3 heads.
Planer, 26x28x6 Hendey.
Punch & shear, No. 3 Royersford, double end.
Radial, 48" Bickford.
Shaper, 25" Milwaukee, b. g. crank, heavy.

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company, • 111 Broadway, New York
Located at our various factories and stores.

LATHES.

12"x 5' Robbins, draw-in attach.
14"x 6' Bradford, c. r.
14"x 6' Whitcomb, taper, pan.
14"x 6' LeBlond, geared head.
15"x 7' P. & W. speed lathe.
16"x 6' Reed, r. & f. rest.
16"x 8' Bradford, c. r.
16"x 8' Von Wyck, quick change.
18"x 6' Prentice.
18"x 8' LeBlond, quick change.

18"x 8' Davis, q. c., raising blocks
to swing 24'.
18"x10' Schumacher, B. & E., quick
change, taper.
21"x 8' LeBlond, grd. hd., hvy. duty.
21"x 8' Bradford, c. r.
21"x10' Bradford, c. r.
22"x 8' Niles, c. r.
30"x14' Niles, c. r.
30"x16' Pond, quick change.

TURRET LATHES.

2"x24" J. & L. cone head.
2"x24" Warner & Swasey, hol. hex.
2"x26" P. & W. turret lathe.
28" size J Gisholt, 3½" spindle.

32"x32"x 6' Gray, 2 heads.
48"x48"x16' Pond, 3 heads.
72"x60"x10' Pond, 2 heads.
72"x72"x24' Pond, heavy forge, 3
heads.
10"x10"x25' Pond, 220 v., d.c. motors.

SHAPERS AND PLANERS.

16" Stockbridge shaper, p. d. f.
14"x 6' Niles sgl. trav. head shaper.
26"x26"x 6' Pond, 2 heads.
30"x30"x 6' Pond, 2 heads.
30"x30"x 8' Pond, 2 heads.
30"x30"x10' Pond, 2 heads.

32"x32"x 6' Gray, 2 heads.
48"x48"x16' Pond, 3 heads.
72"x60"x10' Pond, 2 heads.
72"x72"x24' Pond, heavy forge, 3
heads.
10"x10"x25' Pond, 220 v., d.c. motors.

MILLERS AND GEAR CUTTERS.

No. 1½ Brown & S. univ., late type.
No. 2 Cincinnati plain, cone type.
No. 1 Cincinnati plain, cone type.
No. 2 Cincinnati univ., cone type.
No. 3 Brown & S. univ., old style.
No. 2 LeBlond plain, single pulley.
No. 3 LeBlond, universal, heavy,
late type.

No. 3 Brown & S. vert., old style.
No. 4 36"x8" B. & S. gear cutter.
No. 4 36"x9" B. & S. gear cutter.
No. 6 60"x12" B. & S. gear cutter.
18" Gleason bevel gear generator.
24" Gleason bevel gear planer.
48" Gleason bevel gear planer.

DRILLING MACHINES.

26" B. F. Barnes, sliding head.
32" Aurora, sliding head.
32" Aurora, sliding head, tapping
attachment.
60" Niles, heavy vertical.
3' Grant radial drill and boring mch.

4' Prentice speed box radial.
4' Niles semi-universal, old style.
5' Niles semi-universal, old style.
6' Niles semi-universal, old style.
6' Pond heavy plain radial, 220 v.,
motor drive, d. c.

GRINDERS.

No 2 Brown & Sharpe surface.
No. 3 Rivett internal.
No. 1 Cincinnati cutter and reamer.
No. 3 B. & S. cutter and reamer.

No. 1 Tindell wet saw blade.
4"x30" No. 11 Brown & Sharpe pl.
12"x86" No. 4 Landis universal.
18"x96" Norton plain.

BORING MACHINES.

No. 1 Bement horizontal, 2½" spindle, 5' table.
No. 2 Bement horizontal, 3½" spindle, 6' table.
No. 2 Niles horizontal, 4" spindle, 6' table.
No. 3 Bement horizontal, 4½" spindle, 9' table.
42" Niles boring and turning mill.
72" Niles b. & t. mill, 220 v., motor drive, d. c.

MISCELLANEOUS.

Air compressor, type 10 Ingersoll-Rand, steam driven, capacity 535'.
Air compressor, Ingersoll-Rand duplex, motor driven, with 35 h. p., d. c.,
motor, capacity 215'.
Boilers, 100 h. p. Biglow, (5).
Boilers, 200 h. p. Babcock & Wilcox.
Engine, 164 h. p. McEwen, direct connected to 100 k. w. generator, d. c.
Engine, 200 h. p. Brown, belted to 200 k. w. Westinghouse generator, d. c.
Engine, 500 h. p. Allis-Chalmers, direct connected to 400 k. w. generator,
230 volt, d. c.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Company, 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES.

- 48" Niles car wheel, m. d.
- 46" x 33" Fifield, triple geared.
- 46" x 21 1/2" Fifield, triple geared.
- 38" x 25" New Haven, raised to 56".
- 32" x 13" New Haven.
- 26" x 10 1/2" Walcott, q. c. g.
- 24" x 16" Johnson lathe.
- 24" x 14" Gleason.
- 24" x 12" Lodge & Davis.

- 20" x 12" Prentice, h. s., c. r.
- 20" x 8 1/2" Walcott, q. c. g., (3).
- 15" x 6" Hamilton, h. s.
- 16" x 8" Porter, h. s., c. r.
- 16" x 6" Blaisdell, h. s.
- 14" x 5" American speed lathe.
- 24" x 11" American semi-auto. turret.
- 14" x 5" Fox brass lathe.
- Speed lathes, various sizes, (10).

PLANERS.

- 24" x 24" x 6" Lodge & Davis, 1 head.
- 24" x 24" x 8" Chandler, one head.
- 36" x 36" x 12" Pond, three heads.

DRILLS AND BORING MILLS.

- Burke sensitive bench Nos. 0 & 1.
- 14" Woodward-R. sensitive bench.
- No. 3 Prentice port. rope drive drills.
- 20" Silver, new, plain and bk. gd.
- 20" Foote-Burt mfrs. vertical.
- 24" New Haven plain drill.
- 24" Hoefer, b. g., sliding head.

HAMMERS, BULLDOZERS AND MILLERS.

- 800 lb. Bement-Miles sgl. leg steam.
- 1500 lb. double leg steam drop.
- Bradley cushion helve, 40 lb. & 80 lb.
- Little Giant 50 lb. power hammer.

- No. 2 Brown & Sharpe plain miller.
- No. 4 Brown & Sharpe univ. miller.
- No. 6 Becker vertical miller.
- Williams-White bulldozers, No. 6.

ENGINES, BOILERS AND PUMPS.

- 5" x 5" Erie vertical steam engine.
- 4 h. p. Fowler vertical gas engine.
- 35 h. p. Bessemer horiz. gas engine.
- 40 h. p. Backus horiz. gas engine.

- 50 h. p. White-Middleton gas engine.
- 50 h. p. vert. submerged tub. boiler.
- 6 h. p. vertical single flue boiler, (4).
- Pumps, various sizes and makes.

PUNCHES, SHEARS AND PRESSES.

- 50" throat Reade sgl. end punch and shear; massive construction.
- No. 8 L. & A. geared s. e. punch, 3 1/2" throat, punching cap, 4" x 1".
- Industrial d. e. punch and shear, 12" throat, cap, about 1" x 1".
- Ohl hd. power punch and shear, cap, to punch about 4" x 1", shear 6" x 1".
- Niagara No. 24 hand punch, 15" thr.
- Squaring shears, 30" x 16" & 48" x 8".
- Bliss geared slitting shear, 18" thr.

- Perkins No. 2 rotary shear, 12" thr.
- No. 3 R. & K. inc. presses, 24" str.
- No. 3 R. & K. inc. press, 22" str.
- No. 3 Kohler inc. press, 16" str.
- Max Ama inclinable press, 22" str.
- No. 56 dbl. housing knuckle press.
- No. DG-76 Ferracut single acting.
- No. 32 Greenard arbor press.
- No. 4 Stevenson foot pwr., 6" thr.
- No. 59 Toledo drawing presses, (2).

MISCELLANEOUS.

- Air compressor, No. 6 Au-To 3" x 4".
- Air compressor, s. cyl. 3x5", belted.
- Air compressor, double cyl. 24" x 4".
- Air compressor, 6x6 Laidlaw hor.
- Beltling, leather, various widths.
- Bender, Wallace No. 11 angle, hd. pr.
- Bender, Hinman No. 1 Eye, hd. pr.
- Blower, Root No. 3 Acme, hand.
- Blower, pressure, No. 0 Sturtevant.
- Blower, pressure, No. 3 Sturtevant.
- Blower, Sturtevant No. 3 Monogram.
- Blower, Champion No. 4, fan or vol.
- Blower, Buffalo No. 8, pressure.
- Bolt cutter, 14" Kenyon.
- Brazing table, all iron, 17" x 29 1/2" x 31".
- Cold saw, Gliem, 22" dia., cap, 6" rd.
- Cold saw, Newton, 20" dia., 5 1/2" rd.
- Crane, 10' I-beam, 12' 3" span, with Harrington 6,000 lb. chain hoist.

- Grinder, Landis, 26" x 96".
- Grinders, Western Nos. 1, 2 and 3.
- Grinder, 10" dbl. e. emery, on column.
- Grinder, Diamond 12" d. end bench.
- Grinder, Russell 12" dbl. end bench.
- Grinder, Lancaster 16" d. e. emery.
- Grinder, Barnes 20" wet tool.
- Grinder, 20" Ransom w.t., 250 v., d.c.
- Grinder, Dayton surface, dbl. 5 1/2" x 36".
- Keyseater, 18" x 12", No. 2 Baker.
- Mortiser, Williamsport sash.
- Pipe mch., 6" Curtis, engine driven.
- Polishing stand, Diamond No. 2.
- Polishing stand, d. end, 42" x 12" arbor.
- Polishing stand, Cuyahoga dbl. end.
- Silent chain belt, 16" x 8" x 1 1/2" p.
- Straightener, Shuster 1" rotary, wire.
- Tapping machine, No. 2 Garvin.
- Vises, Forges, Tanks, Lockers.

SECOND-HAND MACHINERY

FOR SALE BY

Brown-McDonald Machinery Co., 2323 N. 9th St., St. Louis, Mo.
BORING MILL.

48" Bullard, vert., 1 plain & 1 swivel hd. on cross rail, face plate jaws, used.

LATHES.

13"x 6' South Bend, c. r., h. s., new.
13"x 6' Champion, c. r., h. s., new.
15"x 8' South Bend, c. r., h. s., new.
16"x 8' South Bend, c. r., h. s., new.
16"x 8' Walcott, q. c. g., d. b. g., c. r.,
h. s., new.
16"x 8' American, q. c. g., used.

DRILLING MACHINES.

No. 1 Burke, bench, with chucks,
new.
Avey, high speed bench.
14" Excelsior, 2 tables, new.
4" Leland Gifford, high speed, with
pump.
3½" No. 101 C-O radial new.
20" Silver, s. b., w. & l., new.

3' Dreses simplex radial, with tap-
ping attachment.
20" Silver, s. b., b. g., p. f., new.
20" Champion, s. b., w. & l., new.
20" Champion, s. b., b. g. & p. f., new.
26" Aurora, b. g., p. f., new.
30" Prentice, s. b., s. h., p. f., used.

SHAPERS.

16", 20" & 24" Milwaukee, b. g., latest improved, new.
18"x24" Hollingsworth, new.
16" Queen City, back geared, used.

SCREW MACHINES.

No. 4 Smurr & Kamen, geared friction head, p. f. to turret, new.
No. 53 National Acme automatic, used.
Wood Tilted Turret.

MILLING MACHINES.

No. 1 U. S. hand, vise and arbor, new.
No. 3 Garvin, hand, used.
No. 2 Pratt & Whitney, Lincoln type.
No. OY Brown & Sharpe, used.

PRESSES.

No. 1 Bauroth, o. b. i., new.
No. 3 Loshbough-J., o. b. i., new.
No. 4 Loshbough-J., o. b. i., new.
No. 3 Kohler, o. b. i., used.
No. 57 Swaine, geared.

No. 4 American, o. b. i., used.
No. 51 Swaine, used.
No. 19 Bliss, o. b. i., used.
No. B. Rockford, o. b. i., used.

SAWS.

Nos. 1 & 2 Marvel, draw cut, new.
GRINDERS.
Nos. 1, 2 & 3 Western, d. e., new.
Nos. 1, 2 & 3 St. Louis, d. e., new.
No. 20 Safety E. W. Co., elec. (4).
U. S., electric, 110 v., d. c., bench.
Heald, ring, 8", used.

Williamson, metal, used.

Essley, cylindrical.
No. 2 Woods, universal tool & cut-
ter, used.
Greenfield universal tool & cutter,
used.

COMPRESSORS.

Nos. 2, 3 & 4 Model B, vert., belted,
new.

Norwalk, steam, 1000 cu. ft., used.

MISCELLANEOUS.

Brake, 6" Dreis & Krump, 16 ga.
Motor, 10 h. p. Wagner, 60 cy., 3 p.,
440 x., 850 r. p. m., used.
Pipe mch., No. 86 Forbes, 4", used.
Presses, No. 1 Greenerd, new, (9).
Presses, No. 2 Greenerd, new, (6).

Pipe machine, 3" Borden, hand
Planer, 36"x36"x12' Patch, o. s., 1 hd.
on cross rail, 1 head on side, used.
Welder, Volland's electric spot, used.
Large stock of tinner's tools.

CHUCKS.

5", 6", 7½", 9" 3-jaw Cushman, univ.,
used.
16" 4-jaw Wescott, combination, cut-
ting off.

SECOND-HAND MACHINERY

FOR SALE BY

Simmons Machine Co., Inc., Albany, N. Y.
1001 Singer Bldg., New York **358 Ellicott Square, Buffalo**
804 Dime Savings Bank Bldg., Detroit

PLANERS.

30"x30"x 8' Pond.	42"x42"x12' Openside, new.
36"x36"x 8' Pond.	52"-74"x52"x24' Betts.
36"x36"x10' Niles.	60"x60"x12' Sellers.
36"x36"x12' Bickett, new.	66"x52"x13' Reliabuilt.
36"x36"x12' Rockford.	74"x52"x14' Reliabuilt.
36"x36"x16' Flather.	14' Hilles-Jones.

LATHES.

14"x 8' Simmons new type, new.	34"x19' Pond.
16"x 8' Simmons new type, new.	38"x14' Pond.
18"x 6' American.	42"x12' Fifeild.
18"x 8' Reed.	33"x 8'6" Fifeild chucking.
20"x 8' American, heavy duty.	24"x36" Marvel.
20"x 8' Fitchburg.	60"x25' Simmons, triple geared, new.
24"x10' Harrington.	4" x48" Marvel engine lathe.
30" English.	

BORING MILLS.

34" King vertical, swing 36".	60" Bullard vertical, 2 heads.
37" Niles vertical, 2 heads.	48" Niles car wheel borer.

MILLERS.

No. 1½ American plain, new.	No. 3-B Owen plain.
No. 2 Garvin duplex.	No. 3 Oesterlien plain.
No. 3-H LeBlond universal, new.	No. 1½ Garvin plain.

GRINDERS.

Premier universal tool-cutter, new.	Dumore electric, equip. A.B.C., new.
No. 5 Brown & Sharpe universal.	St Louis grinding machines, No. 1
18" Hoysdrat-Case, new.	to No. 6, new.

DRILLING MACHINES.

7'3" Warren semi-universal.	38" New Haven.
6' Prentice radial.	36" Snyder upright.
4'6" Bickford radial.	26" Snyder upright.
3'6" Bickford radial.	26" Barnes, sliding head.
3' Dresses plain.	22" Barnes, sliding head.
Moline Hole Hog.	

SHAPERS AND SLOTTERS.

20" Cincinnati, high duty.	12" New Haven crank slotter.
17" Simmons single grd. crank, new.	12" Niles crank slotter.
10" Bement shaper.	18" Bement-Miles crank slotter.

AUTOMATICS AND SCREW MACHINES.

No. 0 Brown & Sharp automatic.	2"x24" Jones & Lamson screw mch.
2" Cleveland model "A".	3"x36" Jones & Lamson screw mch.
No. 52 and No. 55 National Acme.	Pratt & Whitney screw machine.
No. 32½ Garvin turret lathes.	

MISCELLANEOUS.

Air compressor, Chicago, sgl. stage.	Pipe machine, 8" Cox.
Arbor press, No. 5. Greenerd.	Press, No. 55 Bliss.
Bevel shear, Lenox rotary.	Presses, power, Sidney, new.
Brake, 10' Robinson.	Profiler, No. 3 Garvin.
Car wheel borer, 48" Niles.	Punch & shear, Rock River sgl. end.
Cutting-off machine, Curtiss.	Slitting shear & table, No. 100 Bliss.
Pipe machine, 2" Jarecki.	

WOOD-WORKING MACHINERY.

Band saw, 36" Crescent.	Sander, 30" Fay-Egan, 3 drum.
Borer, universal.	Sander, vertical.
Jointer, 16" Greaves-Klusman.	Shaper, 2-spindle.
Planer, pony, 24".	Swing saw.
Router, No. 2 New Britain chain.	

SECOND-HAND MACHINERY

FOR SALE BY

Stocker-Rumely-Wachs Co., 117-121 N. Jefferson St., Chicago

In stock for immediate delivery.

BORING MILLS.

- 24" Industrial Works horizontal boring mill.
60" Bullard with two swivel heads.
84" H. Bickford with two swivel heads.

DRILLING MACHINES.

- Rockford bench.
14" Washburn sensitive.
Taylor & Fenn single spindle high speed.
16" Cincinnati.
24" Fosdick radial.
24" Hamilton, tapping attachment, speed box drive.
6" Gang radial.
No. 9 Prentice Bros. radial with 6' arm.
14" Woodward & Rogers, 4-spindles.
14" Rockford, 4-spindles.

GEAR CUTTERS.

- No. 2 Standard. | No. 3 Farwell gear hobber.
30" x 8" Gould & Eberhardt, spur grs.

GRINDERS.

- No. 12 Brown & Sharpe univ. tool.
No. 1Cincinnati univ. tool and cutter.
12"x48" Modern cylindrical.

- No. 2 Brown & Sharpe auto. surface.
No. 6 Modern, internal.
No. 7 $\frac{1}{2}$ Gardner, disc.

LATHES.

- 12"x 7" South Bend, c. r.
16"x 6" Rockford, c. r., 2 chucks.
14"x 6" Rockford, c. r., 2 chucks.
16"x 6" Lodge & Shipley, compound
rest, quick change gear.

- 18"x 6" Bradford, c. r.
22"x10" American, c. r.
24"x12" Schumacher & Boye, c. r.
32"x18" Bradford, c. r.
37"x18" Fifield, c. r.

MILLING MACHINES.

- No. 2 LeBlond plain.
No. 2 Rockford plain, with single pulley drive, vertical and slotting attach.
No. 15 Garvin plain, with vertical spindle attachment.
No. 2-A Garvin universal.
No. 5-C Becker vertical, new.
No. 12 Brown & Sharpe Lincoln type.

PUNCHES AND PRESSES.

- No. 4 Loshbough-Jordan, o. b. i.
No. 5 $\frac{1}{2}$ Perkins sprue cutter.
No. 2-P American Can.
No. 16 Bliss horn press.
No. 2-A Bliss double crank geared press, 10" stroke.
No. 4-T American Can double crank geared press, 6" stroke.
No. 205-H Toledo crank geared press, new, gap pattern, 96" bet. housings.
No. 3 Ryerson geared punch, 4"x $\frac{1}{4}$ ".
No. 7 Massillon, single end punch and shear, 36" throat, arch. jaws, capacity
14" thru 1", new.

SCREW MACHINES.

- No. 6 Warner & Swasey, geared friction head, a. c. & w. f., power feed to
turret slide.
No. 6 Foster, friction, a. c. & w. f., power feed to turret.
No. 9 Bardsen & Oliver geared friction head, a. c. & w. f., power feed to tur-
ret and cut-off slides.

MISCELLANEOUS.

- Shaper, vertical, 16" Baker.
Slotted, 18" Canadian Machinery Corp., (as good as new.)
Tipping machine, No. 2 Garvin.
Tapping machine, vertical, 1" Rickert-Shafer.

SECOND-HAND MACHINERY

FOR SALE BY

Harris Brothers Company, - 35th & Iron Sts., Chicago, Ill.
ENGINE LATHES.

18"x 6' Fay & Scott.
20"x 8' Pond.
24" Potter & Johnston.
Niles 48" double end car wheel turning lathe.
16"x8' Blaisdell.
18"x8' New Haven.
20"x14' E. P. and H.
24" Pulley turning.
60"x14' New Haven.

SCREW MACHINES.

Nos. 5-A & 6-A Potter & Johnston. | $\frac{1}{2}$ " Pratt & Whitney double spindle
1" Kempsmith hand screw machine. | automatic.
1 $\frac{1}{2}$ and 2 $\frac{1}{2}$ " Cleveland automatics.

SHAPERS.

Pedrick & Ayer open side, traveling head, 20" stroke.

PUNCH PRESSES.

No. 4 Bliss, solid back, b. g.
Queen City, solid back, 5 $\frac{1}{2}$ " throat.
Queen City, solid back, 9 $\frac{1}{2}$ x9" horn.
No. 18 Bliss, o. b. i.
No. 19 Bliss, o. b. i.

SHEARS.

Weiner & Pels steel plate angle and I-beam shear, for 15" beams.
Single end shear, 22" throat, punches 1 $\frac{1}{2}$ " thru 1".
Single end shear, 11" throat, shear 8"x1 $\frac{1}{2}$ ".
Alligator shears, 1 each for 1", 2" and 2 $\frac{1}{2}$ ".

PUNCHES AND SHEARS.

Hilles & Jones 12" throat, $\frac{1}{2}$ " thru $\frac{3}{4}$ ".
Hilles & Jones 21" throat, $\frac{1}{2}$ " thru $\frac{3}{4}$ ".

DRILL PRESSES.

Baush 8 spindle universally adjustable sliding head multi-spindle drill.
20, 26 and 28" upright drills, (3).
2 spindle Hoefer adj. gang drill, No. 5 Morse taper in spds., table 18"x56".

MILLING MACHINES.

1 Newton adjustable horizontal type duplex milling machine, maximum distance between ends of spindles 90", maximum distance from center of spindles to top of table 35", width of table 42", length of table 12'. Motor drive. Machine practically new. Weighs 60,000 lbs.
2 No. 6, 48" swing vertical Becker latest type improved standard milling machines; all power feeds, longitudinal 62"; transverse, 20"; vertical 20"; power down feed to spindle head, 12", power feed to rotary 24".

PIPE MACHINE.

4" Armstrong pipe machine.

HAMMER.

50-lb. Novelty trip hammer.

MISCELLANEOUS.

Buffing stands, (20).
Cold saw, No. 21 Higley.
Cold saw, Q. & C., for 8" rounds.
Gate shear or multiple punch, 60" Queen City.
Grinders, double end heavy floor, for 24x4" wheels.
Grinder, Middleditch combination drill and tool.
Hydraulic presses, 60 and 80 ton, vertical.
Keyseater, 1" Morton.
Nut tapper, No. 4 Rodd automatic.
Steel brake, Dreis & Krump, 10', for 18 gauge.

SECOND-HAND MACHINERY

FOR SALE BY

J. L. Osgood,

Chucking lathe, 21" P. & J. \$ 350.
Screw machine, 1" x 10" P. & W.
hexagon turret 250.

45 Pearl St., Buffalo, N. Y.

Screw machine, No. 5 W. & S. # 375.
Shell cutting-off mchc., 14" Williams
Turret lathe, 12" B. & S. 200.

FOR SALE BY

Lehmann Machine Co.,

608 S. Broadway, St. Louis, Mo.

ENGINE LATHEES.

18" x 10' Boye & Emmes, actual swing 19", 3-step cone, double back geared
with quick change gear box.
22" x 14' Greaves-Klusman, actual swing 23", 5-step cone, single back geared.
All of the above tools are in A-1 condition.

FOR SALE BY

The Osborne & Sexton Machinery Co.,

Columbus, Ohio

LATHES:

9" to 13" Barnes, h. s., cp. r., new.
13-15-16 and 18 O. & S., h.s., c.r., new.
13" x 5" LeBlond, hollow spindle.
16x6 Seneca Falls rel. att., q. c.
18" x 8' Fitchburg, hol. spdl., cp. r.

TURRET LATHEES AND

1" Garvin hand screw machine.
1" S. & K. hand screw mches., (3).
1" Tilted turret hand screw mche.

SHAPERS AND

14" Niles, traveling head.
16, 18 & 24" Barker, back gear crank.
16" Kelly crank, back geared.
20" Rockford back geared, crank.
20" Walcott geared shaper.

PRESSES:

No. 1 Consolidated and Toledo, (10).
No. 19¹ Bliss, 1850 lbs., o. b. i.
No. 5 Garrison, o. b. i.
No. 2 Sidney o. b., inclinable, 1600 lb.
No. 32-P Toledo, nearly new, (4).

DRILLS AND

Henry & Wright sgl. spdl., high spd.
8-spindle, gang, adjustable centers.
3" Canedy-Otto plain, new.
4" Baush plain, heavy pattern.
4" Universal, cone drive.

MILLING

No. 1¹ Valley City universal.
No. 2-B B. & S., sgl. ply., divid. hd.
No. 4 Cincinnati plain.

GRINDERS

No. 3 W. & M. wet surface.
Landis 10x24 universal.
Litter 10x20 universal.

MISCELLANEOUS.

Balancing machine for pulleys.
Band saws, metal, 30" Wright, (2).
Boring mill, 12", 2 swivel heads.
Boring mill, 32" Baush, turret head.
Compressor, 8"x8" H. & B. belt.
Cut-off machine, 3" Davis.

18" x 8' Monarch, q. c. taper.
19" x 12' Gray, compound rest.

20" x 10' Hamilton, double back gear.
21" x 10' and 24" x 12' South Bend.

25" x 24' Fifield.

SCREW MACHINES.

No. 6 W. & S. screw machine.
2x24 & 3x36 J. & L., dbl. equipment.

4" Hartford single spindle auto.

PLANERS.

22" x 22" x 6' Gray, 1 head.

24" x 24" x 8' American, 1 head.

32" x 32" x 10' Niles, single head.

36" x 36" x 16' Pond, single head.

60" x 60" x 18' Betts, 3 heads.

PRESSES.

No. 32 Toledo geared.

Pneumatic, 20 ton, 37" bet. uprights.

Perkins, dbl. crank, 16x24 bolster.

Bliss, 42,000 lbs., toggle drawing.

Covington, 10' 6" between housing.

RADIALS.

Sensitive 1, 2 & 3 spindle.

High speed sgl. spdl. Cleveland.

20" Aurora, with tap. attachment.

24", 26" and 28" sliding head.

Quint 6-hole turret drill.

MACHINES.

No. 1¹ American plain.

No. 1¹ Valley City plain, new.

No. 3 Brainard, 30x7 table.

GRINDERS.

30x10 Webster & Perks, univ., new.

Cutter, reamer and tool, new.

Cincinnati cutter and tool.

HAMMERS.

Hammer, 55 Williams White Justice.

Motor, 75 h. p., 220 volt, 3 phase.

Pipe machines, 2, 4, 6 and 12".

Punch & shear, No. 3A Royersford,

double end.

Straightening rolls, 57" for 2 plate.

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co., 721 St. Clair Ave., N. E., Cleveland, O.

Bought with care, we offer this stock at prices such as our friends can afford in the competition of peace-time manufacture.

AUTOMATICS.

Cleveland automatics from 6" to 2 $\frac{1}{2}$ ", full equipment, fine shape.
No. 33 New Britain auto. chucking machines, five stations and tapping spindle, handle work up to 2 $\frac{1}{2}$ " diameter in chuck jaws and 5 $\frac{1}{2}$ " swing outside chucks, very good, (3).

BAR STOCK MACHINES.

No. 4 Warner & Swasey screw machine, wire feed, friction back grd., power feed to turret, large equipment, collets and round turret, good.
Nos. 4 and 6 Warner & Swasey hexagon turret screw machines, large equipment, late model, excellent condition.
4 $\frac{1}{2}$ "x30" Bardons & Oliver, with all geared head, motor driven, with motor, capacity up to 4 13-16" stock large equipment, excellent condition.

BORING MILLS.

30" Gisholt, single pulley drive, rapid traverse, 3-jaw chuck, good as new.
42" Niles vertical, one swivel, one turret head, 3-jaw table, fine condition.

DRILLING MACHINES.

2-spindle 14" Henry & Wright sens. ball bearing drill, table 17"x12".
No. 11 Natco 8-spindle multiple drill, can be used with 10 spindles, max. drilling area 12"x12"; min. 4"x4", belt feed, fine shape.
20" Barnes drills, back geared, power feed, (4)
22" Hoefer, sliding hd., back gears, power feed and automatic stop, complete.
24" Hoefer upright, sliding head; back gears, power feed and automatic stop.

GEAR CUTTER.

26" No. 3 Brown & Sharpe plain, with all parts, very good condition.

GRINDERS.

Wet and dry Yankee drill grinders.

12" Bristol vertical round surface grinder.

Landis No. 3 universal takes 12"x42".

18" Bryant internal, late model, excellent condition.

LATHES.

Lo-swing lathes, 2-20' tool carriages, fully equipped, good as new, (8).
18"x10' Schumacher & Boye, compound rest, change gears, fine condition.
28"x11' New Haven, compound rest, screw cutting, double friction counter shaft, 4-jaw independent chuck old but good.
32"x14' Fay & Scott compound rest, screw cutting, solid spindle, power feed.
28" 4-jaw independent chuck, old but good.
24" Gisholt turret lathe, late model, motor drive, taper attachment, large equipment, very fine condition.
24" Steinle turret lathes, latest model, fine shape, (2).
Porter-Cable lathes, 6 months old, (6).
17"x8" Sidney nearly new, compound rest, quick change gears, (2).
21" Gisholt turret lathe, taper att., bar holder and drill support, very good.

MILLING MACHINES.

No. 6 Whitney hand miller.
No. 00 Brown & Sharpe plain, hand.
No. 2 Cincinnati vertical, cone type,
good as new, (2). | No. 25 Becker pln. hor., almost new.
No. 3-B B. & S. hi-power, fine shape.
No. 4 B. & S., cone type, chucking hds., vert. attach., etc., very good.

PLANER.

36"x36"x14' Pond, single hd., in good condition, with table 6" thick, no broken T slots or pegged gears, a good rugged tool, fine condition.

PRESS.

No. 78 $\frac{1}{2}$ Bliss straight side single crank press, 10" stroke, bolster 36"x35": all steel gears, friction clutch, tie rodframe with knock out, excellent condition. Weight 52,000 lbs.

SHAPERS.

17" Averbeck crank shapers, late model, excellent condition, (2).

SECOND-HAND MACHINERY

FOR SALE BY

E. L. Essley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

5' Niles full universal radial.
No. 2⁴ Avey single spindle.

GRINDERS.

No. 1 Cincinnati, universal.
No. 3 B. & S. comb., cutter & reamer
No. 190 Wells cutter and reamer.

LATHES.

11"x 5' Star.
13"x 5' Witcomb-Blaisdell, taper.
16"x 8' Von Wyck, taper att.
18"x 8' Bradford, q. c. g., taper att.

SCREW MACHINES.

1" Cleveland automatic.
1" Cleveland automatics, (2).
No. 5 Pearson, hand, fric. head.
1"x15" Pratt & Whitney, plain head.

MISCELLANEOUS.

Bolt cutter, 3-spindle 1" National.
Boring mach., No. 0 Fosdick.
Broaching machine, No. 3 Lapointe.
Cold saw, No. 14 Higley.
Gear cutter, No. 12 B. & S. auto.
Miller, vert., No. 4 Becker-Brainerd.

28"x32" Aurora, sliding head.
No. 11 Natco multiple drills, (2).

6"x32" Norton plain.
No. 1 4"x20" Morse cylindrical.
No. 2 10"x32" Ott universal.

LATHES.

20"x 8' Hamilton.
22"x12' Greaves & Klusman.
24"x12' Prentice Bros.
36"x14' Bradford.

1" Acme, plain head.
No. 4 Foster, plain head.
No. 22 Garvin, 17-16" cap., fric hd.
1" Smurr & Kamen, plain head.

MISCELLANEOUS.

Miller, No. 1-B K. & T. univ.
Planer, 26"x22"x6" Gleason.
Planer, 32"x32"x12" Davis & Egan.
Planer, 42"x42"x8" Whitcomb.
Punch, No. 16C New Doty, sgl. end.
Turret lathe, 2"x24" J. & L.

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

31"x14' Niles, (2).
26"x14' American, d. b. g., q. c. g.
21"x10' Fitchburg.

TURRET LATHES.

22" Gisholt.
3"x36" Jones & Lamson, (2).
7"x14" Potter & J. semi-auto., (2).

DRILL PRESSES.

40" Barnes horizontal radials, (2).
36" Bickford radials, circular base,
table, motor driven, (2).
25" Weigel, with tapping att., (2).

MISCELLANEOUS.

Boring mill, 38" Beaman & Smith.
Grinder, disc, No. 17 Besly.
Grinder, No. 14-12"x5' B. & S. plain.
Grinder, tool room, Head univ.
Grinder, roll, 34"x10" Diamond.
Milling mch., 36"x8" Ingersoll horz.
Milling mch., No. 6 Becker-B. vert.
Milling machine, No. 4B Becker
Brainard vertical.
Milling mch., No. 3 Becker-B. vert.
Milling machine, No. 3 Hendey
Norton, plain.

20"x8'6" Walcott, d. b. g., q. c. g., (3).
16"x 6' Prentice, q. c. g.

And many others.

LATHES.

No. 4 Bardons & O. tur. friction hd.
16" Foster, 1B univ. hollow hex. tur.
And many others.

DRILL PRESSES.

20" Baker, (2).
22" Snyder, (1).
Plain drills, all sizes.
Drill Presses, assorted sizes, (21).

MISCELLANEOUS.

Milling machine, No. 3 B. & S., pl.
Milling machine, No. 3H LeBlond
universal d. b. g., a. c. g.
Milling mch., No. 2A Kempsmith.
Milling machine, No. 15 Garvin.
Milling machine, No. 15 Garvin ver-
tical, q. c. g., (2).
Milling mch., 3 Garvin horiz. hand.
Milling machine, No. 1 Garvin univ.
Milling mch., Bogart Lincoln type
Milling machine, Whitney, hand.
Punch presses, assorted sizes, 28.

BOILERMAKERS' AND SHIP MACHINERY.

Flanging press, 100-150 ton, capacity.
Hammer, steam, Dudgeon, 1500 lbs. capacity.
Punch, 43" gap Perkins, 14"x14".
Riveter, 94" Wood hydraulic.
Shear, 24" Hans Kraut, Beam, Channel and Angle, capacity 3"-24".
Large assortment of General Machinery.

Send for complete list.

SECOND-HAND MACHINERY

FOR SALE BY

Vonnegut Machinery Co., 43 S. Meridian St., Indianapolis, Ind.

MILLING MACHINES.

24x24 Franklin, slab.	No. 1-B Fox.
No. 2-A Becker vertical.	

42"x42"x26' Wheeler.	48"x30"x16' Gray.
42"x42"x12' Wheeler.	

PLANERS.

10-12-L Besly, ring wheel chks., (3).	No. 2 Cincinnati universal.
6-18 Besly, double spdl. ring wheel.	5x18 plain Ott's, (23).
No. 12 Gardner double disc, with	Walls duplex, emery band & disc, (4).
foot treadle, (2).	15" Besly, ring wheel chucks, (3).
No. 120 Gardner double disc, with	18" pressed steel discs, (36).
foot treadle, (2).	

GRINDERS.

1 h. p. Robbins & M., 220 volts, (3).	30 h. p. Robbins & M., 220 volts, (4)
5 h. p. Robbins & Myers, 220 volts.	40 h. p. General Electric, 220 volts.
1150 r. p. m.	30 h. p. Western Electric compensa-
20 h. p. Robbins & Myers, 220 volts.	tor, new.
25 h. p. Robbins & Myers, 220 volts.	

TURRET LATHES AND SCREW MACHINES.

24" Millholland.	No. 2 Warner & Swasey, (2).
13" Gisholt, gap.	2x24 Jones & Lamson, (3).
21" Gisholt, gap.	1½" Bardons & Oliver, (3).
24" Gisholt, gap, (2).	½" Garvin hand screw machine.
28" Gisholt, gap.	

ENGINE LATHES.

12"x 5' Young.	25"x18' Sellers, old style.
14"x 6' Monarch.	38"x20' New Haven, old style, not
16"x 6' Monarch, (4).	screw cutting, (2).
18"x 6' Rumsey.	26"x 7' 6" special pattern on raising
18"x 6' Schellenbach.	blocks.
24"x18' Greaves & Klusman, new.	56"x14' old lathe not screw cutting,
20"x17' Sellers, old style.	cheap.

AUTOMATICS AND SEMI-AUTOMATICS.

19" Potter & Johnston, (4).	1-1/16" Cleveland, 5 hole, (2).
Potter & Johnston, piston ring, (2).	½" Cleveland, 5 hole.
4-spindle, No. 55 Acme, (2).	½" Cleveland, 5 hole, (2).
2" Cleveland, 5 hole, (3).	2" Gridley.

DRILL PRESSES.

No. 1 Avey, single spindle, bench	No. 1-B Avey, bench type, power
type, (87).	feed, (5).
No. 2 Avey, single spindle, tappers,	20" Foote-Burt, 3-spdl., ind. feed.
column type, (6).	No. 0 Garvin duplex horizontal, (2).
No. ½ Avey, bench type.	No. 1 Sellew 2-spdl. drill heads, (6).

HAMMERS.

1500 lb. Niles-Bement-P., steam, (2).	1 80 lb. Jenkins & Lingle, forging.
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MISCELLANEOUS.

Arbor presses, No. 1 Greenerd, (14).	Oil filter, No. 5 style "A" Cross.
Arbor presses, No. 2 Greenerd, (50).	Power punch, No. 4 Whitcomb.
Arbor press, No. 3 Greenerd.	Profiler, 1-spindle Garvin.
Arbor presses, No. 0 Atlas, (16).	Riveting hammers, No. 3-A high
Balancing machine, 24" Defiance.	speed, (3).
Centering machine, 20x10 Whitton.	Tapper, No. 2 Garvin automatic.
Crane and hoist, No. 3 Canton port.	Tapping machines, ½" Rickert-Sha-
Nut tapper, 4-spindle Acme.	fer, (11).

SECOND-HAND MACHINERY

FOR SALE BY

Brownell Machinery Co.,

Drill, 25" Snyder.
Drill, 24" Mueller radial.
Drill, 6" American radial.
Gear cutter, 24" Brainerd.
Gear cutter, 60" Brown & Sharpe.
Grinder, Norton 10"x96" plain.
Lathe, 14"x 6" Hendey, taper.
Lathe, 14"x 8" Flather.
Lathe, 16"x 6" Lodge & Shipley.

11-13 Eddy St., Providence, R. I.

Lathe, 16"x 8" Flather.
Lathe, 20"x12" Lodge & Shipley.
Lathe, 24"x20" Reed, taper.
Lathe, 32"x20" New Haven.
Lathe, 36"x26"x20" McCabe.
Milling mch., No. 3 Cincinnati pln.
Milling mch., 4B Becker vert. rot.
Milling mch., 5C Becker vert. rot.
Planer, 36"x48"x12" Gray, 2 heads.

FOR SALE BY

Strafer Machinery Co.,

Grinder, cylinder. No. 60 Heald, fine condition.
Hydraulic tire press, (truck tires) 150 ton.
Keyseater, No. 2 Mitts & Merrill, full equipment.
Lathe, 14"x 8" Hendey, taper attachment.
Lathe, 16"x 8" Pratt & Whitney taper attachment, chuck.
Lathe, 38"x15" New Haven, power angular feed.
Planer, 28"x28"x 8" New Haven, good condition, low price.

318 N. Front St., Baltimore, Md.

WOOD-WORKING.

36" Band saw.

20" Jointer.

Sold on approval; money back if not satisfied.

FOR SALE BY

The E. A. Kinsey Co.,

Cincinnati, Ohio,

Indianapolis, Indiana

DRILLING MACHINES.

20" Hoefer, b. g., p. f., sta. hd.
4" type BA-I U. S. Electric, 220 volts,
60 cycle, 3 phase.

3" type T., U. S. Elect. 220 v., 60 cy.
National 16-spindle multiple.
Baush 4-spindle multiple.

GRINDERS.

Water tool, 26 in. wheel.

Wesche electric buffing, a. c. motor.

LATHES.

16"x6' Lodge & S., q.c., d.b.g., t.a., b.s.
18"x10' Greaves-K., c. r., s. & f. r.
14"x6' Lutz, t. a., c. r.

30"x20' Harrington, s. b. g.
15" Pryibil spinning, (2).

PLANERS.

32"x32"x8" New Haven.
18" Niles-B.-P. plate, 4" steel plate.
54-54x30 H. P. Betts; rev. d. c. motor.

24"x30"x6" Gray, 1 head, (2).
26"x30"x6" Ohio, 1 head.

TURRET AND SCREW MACHINES.

No. 1 Am. Tool & M. Co., sq. ar., s.
b. g., 4 s. c.
20" No. 7 Bardons & O., g. fr. hd.

No. 4 Brown & Sharpe, w. fd., (8).
3x36 Jones & Lamson flat turret.
No. 2 Warner & Swasey, (2).

MILLING MACHINES.

No. 1½ LeBlond plain.
48" Newton plain.
No. 3 Cincinnati plain.

Newton 21"x6" slab miller.
No. 13 Brown & Sharpe plain.

MISCELLANEOUS.

Abrasive metal cutter, 12" Peters.
Band saw, 36" Towsley, with motor.
Centering att., Carroll No. 2, cap. to 2".
Chain machine, Cross & Spiers.
Chuck, 12" universal.
Cutting-off mch., 3" Hurlbut-Rogers.
Gas furnace, No. 93 Stewart dbl. end.
Gear cutter, spur, No. 3 B. & S., 26".
Gear hobber, 18" Gould & Eberhardt.
Gear hobber, No. 3 Farwell.

Oil pump, Trahern No. 1 F. rotary.
Profilier, Pratt & W. No. 12, belt.
Riveter, 3-16" Schuster, on ped.
Shaper, 12" Smith & Mills.
Saw bench, Beach, table 36x54".
Special internal grinding fixture
Brown & S., for No. 1 universal.
Tapping machine, Garvin No. 1.
Vise, flanged, Brown & Sharpe
No. 4.

SECOND-HAND MACHINERY

FOR SALE BY

Niagara Machine & Tool Works,

Bench lathe, 6"x28" Ames.
Bolt cutter, No. 54 Howard.
Blower, No. 5 Sturtevant.
Die sinker, No. 2 Pratt & Whitney.
Die slotter, 24" Garvin, 2" stroke.
Drill press, 20" Lodge & Davis.

Drill press, 28" No. 2½ Blaisdell.
Grinder, cup, to take cup wheel 10"
diameter.
Hack saws, power.
Planer, 22"x4"10" Powell.
Screw machine, 13"x52" Windsor.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

14"x 6' Blaisdell, r. & f. rest.
14"x 6' LeBlond, c. r., 4-step cone.
18"x10' LeBlond, c. r. & t. a., 5-step
cone, (2).
18"x10' Springfield, c. r., 5-step cone.
17"x 8' Sidney, c. r. & t. a., 3-step
cone, (5).

13"x 5' South Bend, c. r. (3).
15"x 6' South Bend, c. r.
17"x 7' Fulton, c. r., g. f. h. plain
turning lathe.
11"x 3' Blount speed lathes, (4).
Old style stud lathes, (3).

TURRET

14" Lodge & Davis, plain head.
14" Lodge & Davis, b. g.
24" Davis turret boring and chuck-
ing lathe, with forming rest.

LATHES.

1" Millholland plain head turret
screw machines, (2).
No. 4 Warner & Swasey g. f. h. tur-
ret screw machines, (15).

SCREW MACHINES.

1" A Cleveland automatic.
2" A Cleveland automatic.
2" Cleveland full automatic.

1" Millholland plain head turret
screw machines, (2).
No. 4 Warner & Swasey g. f. h. tur-
ret screw machines, (15).

DRILLING MACHINES.

5-spindle Detroit, semi-automatic.
25" Superior, s. hd., tapping attach.

MILLING MACHINES.

No. 3 Garvin, plain, b. g.
No. 2 Bristol, hand, with p. f. to
table, (5).

No. 4 Barr sensitive.
12" U. S. sensitive (7).

MILLING MACHINES.

No. 10 Cochrane-Bly auto. bench
saw filing machine.
Whitney wet tool.
Greenfield univ. cutter and reamer.
B Standard Diamond grinders, (2).
No. 1 Warner & Swasey cock.

GRINDERS.

Type "DE" Hisey-Wolf internal.
Wells universal tool and cutter.
Wilmarth & Morman plain surface.
Capitol internal, (3).
8" Blount emery stand.

HAMMERS.

Coffman, post, power dr., 25 lbs., c. s.
No. 2 Whiton automatic.

100 lb. Cady, belt drop, c. s.

GEAR CUTTERS.

26" No. 3 Brown & Sharpe auto.
11½" throat Giant rivet spinner.
No. 203 Giant rivet spinner.

RIVETERS.

No. 80 Giant riveting machines, (2).
Giant bench type riveting mch., (2).

PUNCH PRESSES.

Toledo double acting toggle draw-
ing press.

No. II Badger, hand.

SHAPERS.

16" Gould & Eberhardt, b. g. crank.

16" Smith & Mills, h. s., b. g. crank.

MISCELLANEOUS.

Cold saws, 12" Burke, (2).
Cold saw, Higley.
Filing machine, Simplex.
Hack saw, Excelsior, power.
Hack saws, Victor, power, (3).
Polishing lathes, Hammond, (3).
Polishing stands, heavy, (2).

Polishing lathes, City Machine Co.
double end, (8).
Polishing head.
Shear, 30" Niagara foot pwr. squaring.
Tapper, 1" Burke, bench.
Tapper, 1" friction vertical bench.

SECOND-HAND MACHINERY

FOR SALE BY

C. M. Thompson Co., - - - 35 S. Clinton St., Chicago

REBUILT TOOLS.

Drilling and milling machine, No. 1 Knight.

Lathe, 26x16'.

Lathe, 32x27'.

Planer, 27x8'.

Punch presses, No. 3, (2).

Shaper, 22'.

Turret lathes, 2" and 3" Jones & Lamson.

NEW TOOLS.

Grinders, hack saws, hack saw blades, and other equipment.

FOR SALE BY

The Enterprise Machinery Co.,

All sizes boilers, compressors, gas engines, steam engines and pumps.

Drill, 6 spindle, sliding head, \$80.

Gear cutter, auto., 36" spur & bevel, will trade for other machinery.

Lathe, engine, bench, 7", 4" h. s., c. r., 3 to 144 thr., new, \$200.

Lathe, 30x12 with 3" boring bar, hvy. table 35x35 for horiz. boring, \$300.

Lathe, 9" foot, ck. gears, tools, \$85.

28-30 S. Clinton St., Chicago

Miller or surface grinder, light, \$65.

Planer, 36"x12', 2 heads, \$750.

Punch press, 21 Bliss, o. b. i.

Punch pr., bench pwr., 14" str., new.

Punch press, No. 2, o. b., \$125.

Screw machine, auto., 3", \$110.

Shears, 36" to 96", power, new.

Shear, slitting, 5 sets knives.

Shear, square power, 16 gauge, 36".

500 Other tools. Write us.

FOR SALE BY

A. D. White Machinery Co., - 108-114 N. Jefferson St., Chicago.

PUNCH PRESSES AND PUNCHES AND SHEARS.

No. 1 American Can, o. b. i.

No. 3 American Can, o. b. i.

No. 3-P Ferracute, solid back.

Waterbury reducing press, 8" str.

No. 29 Bliss, gang, double action.

No. 6 L. & A., 4" thr., cap. 4" s. e.

DRILL PRESSES.

23" Rockford, stationary head.

30" Bickford, sliding head.

42" Barnes, sliding head.

42" Miles plain radial.

1-spindle Henry & Wright, h. s.

2-spindle Prentice, h. s.

4-spindle Guarantee, h. s.

New drills, 14" to 24".

ENGINE LATHES.

14"x 6' LeBlond engine lathe.

16"x12' Beaman & Smith, taper.

20"x 8' Boye-Emmes, d. b. g. c.

24"x10' Putnam lathes, (2).

26"x25' Blaisdell.

13" to 18" New lathes.

GRINDING MACHINES.

18" Norton, floor, (2).

18" Safety Emery Wheel, floor.

2" Springfield, double wheel, floor.

Springfield, dbl. wheel, water.

No. 2 Leland & F., water.

No. 38 Safety Emery Wheel Co.

plow grinder.

MILLING MACHINES AND PLANERS.

No. 3 Cincinnati plain.

22"x22"x5' Ingersoll slab.

No. 6 Becker Brainard, Lincoln.

16"x16"x36" Draper planer.

30"x27"x 6' Putnam planer.

SCREW MACHINES.

1" Hartford, (3).

1" Cleveland.

1" LaVigne.

1" Cleveland, semi-automatic.

MISCELLANEOUS.

Oil gas generator, No. 3 American.

Saw, No. 54 Nutter-Barnes.

Turret lathe, 24"x26" Greenlee.

Turret lathe, 20" Fay & Scott.

Die filing machine, Simplex.

Gas engine, 35 h. p. Columbus.

Gas engine, 55 h. p. Bruce McBeth.

Hammer, 500-lb. Sandage.

Hobber, No. 1 Farwell.

SECOND-HAND MACHINERY

FOR SALE BY

H. D. Warner,

Automatic, 1 $\frac{1}{2}$ " multiple-spindle Gridley.
 Automatics, 2 $\frac{1}{2}$ " multiple-spindle Gridley, (4).
 Automatics, No. 24 New Britain, (10).
 Automatics, No. 54 New Britain, (5).
 Automatics, No. 00 B. & S., (10).
 Automatics, No. 0 B. & S., (4).
 Automatics, No. 2 B. & S., (5).
 Automatic, 1" Cleveland.
 Automatic, 1 $\frac{1}{2}$ " Cleveland.
 Automatics, 3 $\frac{1}{2}$ " Cleveland, (2).
 Broaching mch.s., No. 1 Lapointe, (6).
 Drill press, 3-spindle Allen.
 Drill press, 4-spdl. Norton & Jones.
 Drill press, 4-spindle Barnes.
 Forming machine, No. 00 B. & S., automatic turret.
 Gear hobber, Gould & E., 24"x10".
 Grinder, No. 2 Landis universal.
 Hammers, Bradley helve, new, (6).
 Hammer, steam, 600 lb. Niles-Bement-Pond, nearly new.
 Hammer, steam, 1,000 lb. Niles-Bement-Pond, nearly new.
 Hammers, steam, 1,200 lb. Niles-Bement-Pond, nearly new.
 Header, 4" Acme hot bolt.

57 May St., Hartford, Conn.

Hammers, board lift drop, 400 lb. Billings & Spencer, nearly new, (6).
 Hammers, board lift drop, 600 lb. Billings & Spencer, nearly new, (7).
 Lathe, J. & L., sliding head, 2"x24".
 Lathe, J. & L., tur., sl. hd., 3"x36".
 Miller, Kempsmith No. 2 universal.
 Millers, P. & W. Lincoln, (6).
 Millers, Briggs type A, (2).
 Pickling machine, automatic.
 Press, No. 76 Bliss.
 Press, No. 77 Bliss.
 Press, No. 85 Toledo, 1" stroke.
 Press, embossing, No. 26 Bliss.
 Press, embossing, No. 27 Bliss.
 Press, W. F. F. toggle, 9"x4 $\frac{1}{2}$ ".
 Profilers, P. & W. 2-spindle, (4).
 Pulleys, 2000 steel split, assort. sizes.
 Rivet spinners, Grant, (4).
 Rotary annealing furnace, American Gas Furnace Co.
 Screw machine, No. 3 P. & W., hand.
 Shear, alligator, to cut 1 $\frac{1}{2}$ " square cold steel.
 Spot welder, Toledo, 1" capacity.
 Threading machines, type 2 Geometric, (4).
 Tote boxes, metal, assorted sizes (15,000).

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

14"x 6' Hendey.
 14"x 6' Whitcomb-Blaisdell.
 14"x 6' Lodge & Shipley.
 15"x 6' Von Wyck.
 18"x 8' American.
 18"x 8' Mueller.
 18"x 9' Chard.

12", 14", 16", 20" and 24" shapers.
 14"x14"x20' planer.

16" 2-spindle Avey.
 16" 6-spindle Allen.
 16" Elmore, high speed.

No. 3 Burke, bench.
 No. 2 Knight, vertical.
 Fox hand miller.

LATHES.

20"x 8' Lodge & Shipley, geared hd.
 21"x10' LeBlond, heavy duty.
 22"x10' Davis, heavy duty.
 26"x10' Walcott.
 22"x22' old style.
 3"x36" Jones & Lamson.

SHAPERS AND PLANERS.

24"x24"x 6' Pease planer.
 36"x36"x12' Pond planer.

DRILLING MACHINES.

20" Barnes.
 24" Henry & Wright, high speed.
 D-4 Colburn, heavy duty.

MILLING MACHINES.

No. 2 Rockford, universal.
 No. 4 Becker-Brainerd.

MISCELLANEOUS.

Bolt header, 1 $\frac{1}{2}$ " Blakeslee.
 Brake, 8' steel, No. 18 capacity.
 Brake, 10' steel, No. 16 capacity.
 Bulldozer, No. 3 Fisher.
 Fox monitor lathe, Lodge & Davis.
 Gear cutter, 26" Cincinnati.
 Grinder, No. 38 plowshare.
 Hammer, 200 lb. Bradley.

SECOND-HAND MACHINERY

WANTED BY

The Warner Manufacturing Co.,

Ottawa, Kansas

One 10x40 or larger Norton or Landis plain grinder.
 One air compressor, capacity 500' of air per minute.
 One 30' or wider 3 to 10 ton electric crane.
 Two 24" or larger drill presses, heavy duty type.
 One No. 0 Barrett mill.
 One Lapointe broaching machine.
 One 20 or 22" Streit pulley machine.
 Two 24" stripping plate machines.

We are in market for first-class second-hand machinery only;
 no junk considered.

FOR SALE BY

Girard Machine & Tool Co., 491-493 N. Third St., Philadelphia, Pa.

Boring and chucking machine, vertical, 36" Brown & Sharpe.
 Engine lathe, 21"x12" Lodge & Davis, taper attachment.
 Engine lathe, 24"x12" Pratt & Whitney.
 Engine lathe, 25"x16" Blaisdell, taper attachment.
 Engine lathe, 28"x12" New Haven.
 Engine lathe, 28"x20" Putnam.
 Lathes, lot of 12, 14, 16 and 18" q. c. lathes, with various size beds.
 Milling machines, No. 4 Cincinnati, No. 3 Brainard, and lot of others of
 various sizes.
 Planer, 36"x36"x12" Wilson, two heads on cross rail.
 Planer, 26"x26"x 6' Pond planer, with one head on cross rail.
 Planer, 24"x24"x 6' Woodward & Powell, with one head.
 Shapers, 20" and 24".
 Turret lathes, 2"x24" Jones & Lamson, geared set-over head, single pulley
 drive, bar equipment, (4).
 Turret lathe, 3x36 Jones & Lamson, (5).
 Turret lathe, 24" Gisholt.
 Turret lathe, No. 3 Foster, 14" chuck capacity, oil pan, plain head.
 Large lot of screw machines, drill presses, grinders, etc.

FOR SALE BY

B. C. Allen Machinery Co.,

		104 S. Clinton St., Chicago
Blowers, Nos. 4 and 6 Buffalo.		
Bolt cutter, 2"	\$ 90.	
Drill press, 14" sensitive	45.	
Drill press, 16" high speed	140.	
Drill press, 24" sliding head	125.	
Drill press, 2 spindle	65.	
Drill press, 4 spindle	165.	
Exhaust fan, 24"	30.	
Gear cutter, 50" G. & E.	1,000.	
Grinders, Nos. 1, 2, 3 and 4....		
Grinder, die	65.	
Hack saw, 4"x4"	15.	
Hack saw, 8"x8"	25.	
Lathe chucks, 7, 9, 14 and 16"		
Lathe, 14"x6" Hendey, q. c. g. and taper attachment	600.	
Lathe, 16"x6" Advance, q.c.g., 3-step cone, d. b. g.	600.	
Lathe, 6"x8" Lodge & Davis	350.	
Lathe, 18"x10" Lodge & Davis	450.	
Lathe, 37"x16" Wright.....		\$ 700.
Miller, P. & W. hand.....		90.
Miller, Burke No. 3, hand.....		125.
Miller, No. 9 Kempsmith pl..		800.
Press, foot.....		35.
Polishing lathe.....		20.
Pipe machine, No. 7 Jarecki		135.
Planer, 27"x21"x7"		450.
Planer, 32"x32"x8"		450.
Punch press, No. 0, solid back		65.
Punch press, No. 1, solid back		125.
Punch press, No. 5, solid back		425.
Shaper, 6" crank.....		125.
Shaper, 15" crank.....		300.
Square shear, 22"		25.
Square shear, 30"		40.
Square shear, 36", gap 18"		135.
Welding torches, leak proof.		
Write for prices, etc.		

SECOND-HAND MACHINERY

FOR SALE BY

Frank H. Parker Company, First Nat'l Bank Bldg., Chicago, Ill.
Machinery Merchants—Two Phones, Randolph 886 & 925

Bending roll, 10' Bertsch, capacity $\frac{1}{2}$ ", weight 10 tons.....	\$ 1800.
Lathe, 25"x22' Niles, 17' centers, c. r., s. s., 5-step cone.....	1000.
Lathe, 42"x16' Niles, 11 $\frac{1}{2}$ ' centers, c. r., s. s., 4-step cone.....	1600.
Lathe, 48"x14' (no name on it) 9' centers, c. r., s. s., 4-step cone.....	800.
(This old lathe has d. b. g. and face plate drive, but bearings are 24")	
Milling machine, big heavy slab table is 20'x72", weight 6 tons.....	1500.

All above machines are old, probably 25 to 35 years—
 But are priced accordingly, they are in working order.

FOR SALE BY

Peninsular Machinery Co., 281 E. Jefferson Ave., Detroit, Mich.

Drill, 10" Hoefer, friction disc.	Lathe, 17"x 8' LeBlond rap. produc.
Drill, 20" Rockford, back geared.	Lathe, 17"x10' LeBlond automobile.
Drill, 23" Rockford, back geared.	Lathe, 18"x 8' LeBlond engine.
Drill, 24" Rockford, sliding head.	Lathe, 18"x8' LeBlond engine, quick
Drill, 24" Fosdick radial.	change gear, motor drive.
Drill, Pierie high spd. ball bearing.	Lathe, 20"x10' LeBlond engine.
Gear cutter, No. 3 Brown & S. auto.	Lathe, 25"x12' LeBlond engine, h. d.
Grinder, 16"x36" Queen City cyl.	Lathe, 30"x16' Pond.
Grinder, No. 1 LeBlond univ. cutter.	Miller, No. 2 $\frac{1}{2}$ LeBlond universal.
Grinder, No. 2 Grand Rapids, drill	Miller, No. 3H LeBlond universal.
and tool.	Planer, 24x24"x6' Rockford, agl. hd.
Grinder, No. 1 Blount, double end	Planer, 28x28"x8' Rockford, sgl. hd.
emery.	Planer, 30"x30"x18' Rockford, 2 hds.
Grinder, No. 6 Blount, d. e. emery.	Planer, 54"x54"x30' Betts heavy pat-
Groover, No. 3 Niagara.	tern, reversing motor drive.
Lathe, 11"x 4' Blount speed.	Shaper, 16" Rockford, back geared.
Lathe, 14"x 6' LeBlond engine.	Shaper, 20" Rockford, back geared.
Lathe, 16"x 6' LeBlond engine.	

FOR SALE BY

Geneva Cutlery Corporation - - - Geneva, N. Y.

Cupola blower, cast iron, B. F. Sturtevant Co. No. 2, single drive, bottom discharge, 1 countershaft, platform. Condition good.	
Exhaust fan, cast iron, No. 6 Champion Blower & Forge Co., 48"x6"x8' pine platform for blower, countershaft, platform. Condition good.	
Gas lamps, Humphrey, (19). Condition good.	
Plating dynamo, Zucker, Levett & Loeb Co. No. 3034, Type C. Improved American Giant, speed 1450, with countershaft and wood bench, bracket. Condition fair.	
Printing, embossing, cutting and creasing press, National Machine Co. "Galley Improved", double geared, size 20x30; two 36"x34" fly wheels, 16"x4" tight and loose pulleys with American Press Guard Co. guard; three chases; five cutting boards. Condition A1.	
Pump, 3" Gould Mfg. Co. Fig. 1239, water tank and piping, 10x2 $\frac{1}{2}$ pulley installed. Condition good.	
Razor file cutting machine, Hess Machine Works, 6x1 $\frac{1}{2}$ tight and loose pulley. Condition A1.	
Right angle drives, No. 3 Robinson, 20 h. p., (2). Condition A1. Purchased from Root, Neal & Co. Buffalo, N. Y.	
Shaper, metal, 16" Gould Machine Co. old style horiz. crank, 13"x10"x13" table with 8"x2" rigid vise, power cross feed, 4-step cone pulley drive and countershaft, old style open frame, with grinding attachment.	
Solid clutch coupling bore, 16" Dodge, speed 360, 2 15/16" hole, 40 h. p. Condition good.	
Solid clutch, Dodge, 2 3/16" hole, 25 h. p. Condition good.	

SECOND-HAND MACHINERY

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

12"x 7'6" new Carroll-J., pln. chg.	19"x 8' new Sidney, q. c., swings 21".
14"x 6' new Carroll-Jamieson, q. c.	20"x12' Hendy, q. c., taper attach.
15"x 6' new Sidney, q.c., swings 17".	25"x14' new Sidney, q. c., swings 27".
16"x24' new Rahn Larmon,d.b.g.,q.c.	33"x12' Putnam.
17"x 8' new Sidney, q. c., swings 19".	

TURRET LATHES.

24" Davis chucking.	No. 1 Bardons & Oliver, screw.
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VERTICAL BORING MILLS.

60" Bullard, two heads.	64" Niles, two heads.
-------------------------	-----------------------

36"x36"x 8' Gray, two heads.	27"x23"x 6' Smith, one head.
30"x27"x 8' Smith, one head.	18"x 8"x 3' Wheeler, one head.

16" new Steptoe, b. g.	24" Hendy.
20" new Steptoe, b. g.	16" Barker, traveling head.
24" new Steptoe, b. g.	

MILLING MACHINES.

No. 4 Brown & Sharpe, plain.	24"x7"x18 Oesterlein, plain.
No. 3 Cincinnati universal.	No. 12 new American, plain.
No. 2-C Rockford universal.	No. 0 Steptoe, hand, new.

GRINDERS.

No. 1 Fraser universal, new.	No. 1 Landis internal.
No. 1 Grd. R., new cutter & reamer.	No. 190 Wells.

DRILLING MACHINES.

60" Bickford radial.	32" new Superior, sliding head.
48" Fosdick radial.	28" new Superior, sliding head.
36" new Superior, sliding head.	25" new Superior, sliding head.

Second-Hand Wood-Working Machinery

For a large list of used wood-working machinery, consult the **Wood-Working Machinery List**, a publication similar to this but devoted to the advertising of saw-mill and wood-working machines. A copy may be had on application to the publisher, **A. H. Hitchcock, 1220-1235 Caxton Building, Chicago, Ill.**

Re MANUFACTURED -(ORIGINATED BY US)- MACHINE TOOLS

Real Bargains

Every Re-Manufactured machine is being offered at real bargain prices. In fact, we can sell our Re-Manufactured tools, which compare favorably with new, at prices lower than those of the ordinary used tools.

MILLING MACHINES

- 1-No. 14 Garvin Plain.
- 2-No. 9 Kempsmith, Plain.
- 1-No. 2 Becker-Brainard Plain.
- 1-No. 2 Cincinnati Plain.
- 1-No. 1-B Kearney & Trecker Pl.
- 1-No. 2-A Kearney & Trecker Pl.
- 1-No. 2-B Kearney & Trecker Pl.
- 1-No. 3 Brown & Sharpe Vertical.

BORING MACHINES

- 1-30" Bullard Vertical.
- 1-52" Niles Car Wheel Borer.
- 1-Beaman & Smith Horiz. Cylinder Boring and Milling.
- 1-6" bar Sellers Cylinder Boring and Facing machine.

RADIAL DRILLS

- 1-5' Universal.
- 1-5' Putnam.
- 1-5' Baush.
- 1-64" Baush.

PLANERS

- 1-24"x24"x 6' Hamilton.
- 2-24"x24"x 6' American.
- 1-26"x26"x 6' American.
- 1-26"x26"x 8' Gray.
- 1-30"x30"x10' Cincinnati, 2 heads.
- 1-36"x36"x10' Cincinnati, 2 heads.
- 1-36"x36"x12' Sellers Spiral, 2 hds.
- 1-48"x48"x18' Sellers Spiral, 1 hd.
- 1-76"x48"x18' Woodward & Powell, 3 heads.

TURRET & SCREW MACHES.

- 1-12" Foster-Kimball.
- 3-16" Pratt & Whitney.
- 1-22" Steinle Turret.
- 5-24" Gisholt Turret.
- 1-24" Warner & Swasey Chucking.
- 1-24" Foster Turret.
- 1-18" American Screw.
- 2-2"x24" Jones & Lamson, Geared Head.

GEAR CUTTERS

- 2-26" Cincinnati Spur.
- 2-No. 3-26" Brown & Sharpe Spur.
- 1-36" Gould & Eberhardt Hobber.
- 1-No. 4 Schuchardt & S. Hobber.

GRINDERS

- 1-4"x20" Morse Plain.
- 1-6"x32" Norton Plain.
- 5-12"x24" Modern Plain.
- 1-No. 60 Heald Cylinder.
- 1-No. 70 Heald Internal.

PRESSES, ETC.

- 1-36" wide Power Corrugating Roll.
- 1-36" Robinson Power Brake.
- 1-No. 2 Bethlehem Power Slitting Shear.

MISCELLANEOUS

- 1-4" Greiner Rotary Riveter.
- 1-7" Nutter-Barnes Cold Saw.
- 1-No. 525 Newton Steel Foundry Cold Saw.
- 1-Williams Metal Band Saw.

Write for our Green List describing these and many others

HILL, CLARKE & CO. OF CHICAGO
649 W. WASHINGTON BLVD., CHICAGO, ILL.

Machinery for Immediate Delivery

No. 1 Kempsmith Universal Milling Machine.
No. 2 Kempsmith Plain Milling Machine.
Standard Eng. Company Hand Miller with power feed.
U. S. Whitney type Hand Miller.
Becker B1 Vertical Miller with rotary table.
Becker No. 3 Vertical Miller with rotary table.
Hendey 20" Back Geared Crank Shaper.
No. 2 Wilmarth & Morman Surface Grinder.
No. 2½ Bath Grinder, equipment C.
No. 2 Foster Screw Machine, automatic chuck.
No. 3 Foster Screw Machine, automatic chuck.
No. 4 National Screw Machine, geared friction head.
14x6 Walcott Double Back Geared Lathe.
16x6 Walcott Double Back Geared Lathe.
18x8 Walcott Double Back Geared Lathe.
24" Hoefer Sliding Head Drill.
28" Hoefer Sliding Head Drill.
Canedy-Otto 3½' Radial Drill.
No. 4A High Speed Hammer Company Riveter.

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Honest Service—Machines In Stock

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Drill Presses, Snyder, 23" Stationary head, 25" Sliding head.
14"x6' Champion Q. C. Lathe with taper attachment.
No. 32-B Demco Floor Type Drill Presses, two and three-spindle.
No. 6 Bickett Profiling Machine.
10x30 Webster & Perks Universal and Cylindrical Grinders.
No. 4½ Bardons & O. Turret Lathe, power fd. to cut-off, and turret and
Webster & Perks Nos. 1 and 2 Floor Type Grinders. [reg. equip.
No. 1 Wilmarth & Morman Universal Grinder.
No. 2-B Washburn Shops Drill, two-spindle.
No. 1 Toledo Hand Milling Machine.
No. 2 Grand Rapids Universal Grinder.

USED MACHINES

18x8 Greaves & Klusman Lathe.
No. 1 Wilmarth & Morman Surface Grinder.
No. 3-26" and 36" Brown & Sharpe Gear Cutters.
No. 1 two-spindle Garvin Tapping Machines.
No. 18 A Milwaukee Milling Machine.
12"x6" and 24"x12" Gould & Eberhardt Gear Hobbers.
No. 2 Bardons & Oliver Turret Lathe.
No. 1 Brown & Sharpe Automatic Screw Machine.
No. 1 Warner & Swasey Hol. Hex. Turret Lathe, bar & chucking.
No. 1 Adams Gear Hobber. [good condition.
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PRATT & WHITNEY 8 Spindle Multiple Drill,
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34" BARNES Sliding Head, Upright Drill, Bk. Gear.
28" CLEVELAND Sliding Head, H. S., Double Back
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25" CLEVELAND Sliding Hd., B. G., Upright Drill.
20" SILVER Stationary Head, B. G., Upright Drill.
20" SILVER Stationary Head, Wheel and Lever Feed
Upright Drill.
16" CLEVELAND Dbl. Sp., H. S., B. B. Sens. Drill.
14" ROCKFORD Sgl. Sp. Sens. Drills, Motor Driven.
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97"x32" bed Trip. Grd., Face Plate Dr. Engine Lathe.
Large stock of smaller lathes from 10" up.
20" KELLY Back Gear Crank Shaper, NEW.
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WANGLER Rotary Beveler, Cap. $\frac{3}{4}$ " plate.
SCULLY 6' Bending Rolls, pyramid type, drop end,
 $\frac{1}{2}$ " plate.
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18-22-26-30-32-36-42-54-60" between housings; 1-2-3 and 4 heads.

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30", 36", 52", 76" and 10'.

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24", 3", 4"; also 5" Barret type.

Radial Drills

2 1/2", 3 and 6"-Plain and Universal.

Upright and Multiple Drills

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Lathes

Various sizes from 16" to 92" swing, 6' to 32' beds.

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2x24", 20x6", 20" also 34".

Milling Machines

48x36x14' Ingersoll 4 heads; 20"x7' Brainerd.

36' Shaper; 54' Slotter.

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Practically New Machines

- 2-No. 4 Warner & Swasey Turret Lathes, complete with power feed to the turret and power feed to the cut-off.
- 1-No. 4 Warner & Swasey all geared head, universal Turret Lathe, complete.
- 1-No. 4 Warner & Swasey grd. friction hd. Turret Lathe, complete.
- 1-No. 4 Warner & Swasey geared friction head Screw Machine with automatic and wire feed, power feed to the Turret.
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- 1-No. 2 Brown & Sharpe Universal Grinder.
- 1-No. 1 Landis Internal Grinder.
- 1-26x10' Schumacher & Boye Lathe, 3-step cone, double back gears, quick change gears.
- 1-24x12' Bradford Engine Lathe, single back gear, 4 step cone.
- 5-Porter-Cable Lathes.
- 1-3' Morris Radial Drill.
- 1-30x36x12' Whitcomb Planer, 2 heads on cross rail.
- 1-30x30x 8' Pond Planer, one head on cross rail.

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No. 2 Rochester, table type, belt driven.
2-spindle Moline adjustable center cylinder borer.

DRILLING MACHINES.

1-spindle Henry & Wright ball bearing, sensitive, 24 swing.
2-sp. Taylor & Fenn manufacturing.
3-sp. Taylor & Fenn manufacturing.
4-spindle 14" Foote-Burt.
6-spindle Gardam.

4-spindle 26" Barnes, sliding head gang drills, 3 jaw chucks, (2).
14-spindle No. 0 Fox.
25" Blaisdell sliding head drill.
28" Snyder, sliding head, (2).
10" Barnes sensitive, (3).

GRINDERS.

10x48 Pratt & Whitney plain.
No. 2 Oakley univ. cutter and tool.
Simmons cutter and tool, (2).
No. 1 Norton cutter and tool, (2).
No. 11 Landis plain.
BX Yankee tool grinder.
12x60 Landis universal.

No. 11 Rivett, oscillating.
No. 6 Bryant internal.
48"x6' Springfield, surface.
"H" Point Yankee twist drill.
6x32 Norton.
No. 1 Hartford auto. surface.
No. 5 Rivett radial grinder.

LATHES.

14"x6' Prentiss Brothers, compound rest.
16"x6' Porter, 5-step, pl. rest, p. c. f., special draw-in chuck.
16"x7' Lehmann.
16"x8' Cincinnati, d. b. g., quick change gears.
16"x8' Lodge & Shipley, q. c., 5-step, taper att.
18"x8' Perkins.

18"x8' Reed.
17"x8' Hamilton, 5-step, c. r., p. c. f., 11" h. z.
20"x12' Fifield.
22"x6' Beaman & Smith.
26"x12' Putnam, d. b. g., c. r., (2).
30"x10' Gleason, plain rest, power cross feed.
38"x20' New Haven.
56"x24' Wood Light.

MILLING MACHINES.

No. 12 Cincinnati plain, (4).
No. 3 Fox plain, power feed.
No. 14A Garvin plain, (5).
No. 14 Garvin plain, (7).
Rivett swivel miller.
No. 3 Van Norman duplex.
No. 12 Brown & Sharpe manufacturing miller.

Grant manufacturing.
No. 2 Pratt & Whitney, Lincoln miller.
No. 2 Brown & Sharpe vertical, 20" circular att., power feed.
No. 3 LeBlond plain, all power fds., geared feed box.

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18" No. 34 National Acme auto.
20x7 Fay & Scott, turret.
24" Gisholt, turret.
48" style "A" Cleveland auto., (2).
2" Cleveland automatics, (9).
4-sp. National Acme automatic, with stock stand.
24" Davis turret chucking lathes, set-over turret, friction grd. head, p. f., 4" belt, 2 1-16" h. z.

No. 5A Potter & Johnston auto. chucking machine.
No. 1 W. & S. hex. tur. lathes, fric. b. g. hd., auto. chuck and roller fd.
" Rivett, wire feed.
" Pratt & Whitney.
" National Acme automatic.
" Rivett, plain turret.
No. 1 Brown & Sharpe, hand feed, (2).

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28x10 Cincinnati.

| No. 2 Whiton.

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Brake, 4' Ohl, double cam.
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1 24" Reed-Prentiss.
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MILLING MACHINES.

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 - 8 Type "A" Briggs.
 - 12 No. 6 Whitney Hand.
 - 6 8" Pratt & Whitney Automatic.
 - 1 10" Pratt & Whitney Automatic.
-
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 - 6 No. 6 Bryant Internal.
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 - 10 No. 1½ Cincinnati Cutter and Tool.
 - 12 No. 60 Heald Cylinder.
 - 6 No. 75 Heald Internal.
 - 3 12" Heald Rotary.
 - 7 Garrigus Rotary, 10" Magnetic Chuck.
 - 10 10x36 Norton.
 - 6 10x50 Norton.
 - 1 14x36 Norton.
 - 8 No. 205 Rivett Hand Oscillating.
-
- ## MILLING MACHINES.
- 10 21½x10' South Bend.
 - 8 Automatics, $\frac{3}{8}$ "- $\frac{1}{2}$ " Cleveland.
 - 1 Chucking Machine, 1"x7" Acme Plain.
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 - 3 Piston Ring Machines, Gridley, Plain, with Full Equipment.
 - 2 Piston Ring Machines, Gridley, Eccentric, with Full Equipment.
 - 2 Piston Ring Machines, No. 1½ Potter & Johnston, Plain, with Full Equipment.
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6' Bullard, two swivel heads, condition good.
6' Cincinnati Massive, two swivel heads, same as new.

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No. 22 Demco sensitive bench, new, (10).

Tow-spindle Sipp high speed sensitive.

No. 117 Moline heavy single spindle "Hole Hog", (2).
Moline multiple spindle rail drill, eight heads.

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16"x12' Lodge & Shipley, selective hd. type "Q", q. c., slightly used.
20"x 8' Blaisdell, plain rest.

24"x 7' compound rest, turret on shears.

21"x10' LeBlond crankshaft lathes, good condition, (2).

32"x16' Fay & Scott, compound rest, tur. on shears, turret tool post.

TURRET LATHES AND SCREW MACHINES.

14" Gray turret lathes, back geared, 18" swing, pan bed, (2).

3"x36" Jones & Lamson flat turret, bar equipment.

1" Truman M. Smith screw machines, wire feed plain head, cut-off rest, (2). one new, one slightly used.

MISCELLANEOUS.

Automatic, 1" Cleveland.

Automatic, 1" Hartford.

Cold saw, 12" Burke.

Pipe machine, 3" Stoever.

Slitting shear, No. 12.

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Grand Rapids Specials

Balancing machines, Rockford, bench, (6).
Bolt cutter, 2" Acme.
Boring mill, 34" vertical.
Brake, No. 4 Chicago, hand.
Compressor, 4x5 Imperial, type 12, (2).
Drill, 26" Sibley, sliding head.
Drill, 10-spindle Grand Rapids multiple.
Electric welder, No. 140 Toledo.
Flexible shaft, No. 5 Plank.
Furnace, No. 4 Hardinge.
Grinder, disc, 83" Besly No. 19.
Grinder, drill, No. 24 Avey high speed.
Grinder, drill, style B Yankee.

Grinder, universal, No. 2 Bath.
Hack saw, No. 4 Monarch.
Hammers, 100 lb. Little Giant, power, (2).
Hammer, 250 lb. Little Giant, power.
Lathes, 24"x8' South Bend, 36" gap, (4).
Miller, No. 25 Becker plain.
Miller, No. 37-B Chicago, small.
Miller, No. 1-C Fox plain.
Miller, No. 3 heavy, plain.
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Sand blast outfit, No. 6 Pangborn, (2).
Shears, circle, No. 278 Waugh.

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250 Ton Mesta, Steam Hydraulic Forging Press.
No. 512 Bliss Double Acting Press, 33 tons working pressure, weighs 16,000 lbs.

No. 540 Max Arms Geared Press, 8" stroke, weighs 5600 lbs.
1500 Bliss Board Drop Hammer.
1500 United Engineering Co. Board Drop Hammer.
450 lb. Bell, open frame, steam hammer.
80 lb. Yeakley, pneumatic Hammer.

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No. 7 Hilles & Jones Multiple Punch, weighs 50,000 lbs.
Carlin Alligator Shear, 12" blade, capacity 1".
No. 4 BA Cleveland Punch, 19" gap, capacity $\frac{3}{8}$ " through $\frac{3}{8}$ ".
Newbold Rotary Splitting Shear, capacity 1", throat 28".

Planers

60"x48"x20' Gleason, 2 swivel heads on cross rail, 1 side head.
48"x36"x16' Detrick & Harvey Open Side, 3 heads.
48"x36"x10' Ohio, 2 heads.
36"x36"x14' Cincinnati, 2 heads.
30"x30"x14' Flather, 2 heads.

Lathes

50"x20' Pond, triple geared, etc.
38"x14' Fay & Scott, heavy duty, 3" hollow spindle.
30"x12' Israel Johnson, heavy duty, triple geared, face plate drive.
28"x12' Fay & Scott.
20"x 8' Lodge & Shipley, geared head, single pulley drive.

Radial Drills

6' Bickford, semi-universal.
6' Bausch, box table.
5' Bausch, motor driven.
5½' Niles, semi-universal.

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Two (2) Newton, heavy type, vertical, heavy duty, heavy facing cutter heads, 36" diameter, good as new.
No. 2 Hendey, plain, back geared.
No. 3 Hendey, plain, back geared.
No. 2½ Garvin Universal.

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Machine Tools Immediately Available

One Kempsmith No. 3 Universal Milling Machine, new.
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One No. 2 Milwaukee Plain Milling Machine, all feeds, cone driven, excellent condition.
Two Gisholt 21" swing Turret Lathes, taper attach., excellent cond.
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One Fifield 30"x10' triple geared Engine Lathe, excellent condition.
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One Pratt & Whitney 30"x14' Planer, one head, excellent condition.
One Chandler 36"x12' Planer with two heads, arranged for motor drive, high speed type, excellent condition.
One Whitcomb-Blaisdell second-belt drive planer, 26"x8', two heads on the rail, new.
One Bath Universal Grinder No. 2, 10x24, guaranteed practically new, complete equipment.

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- 1—Pumping System and 1—3000 Tank for above.
- 1—Bending Floor 10' x 30'.

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- 1—No. 2-A Landis 16x32 Universal Grinder.
- 2—No. 3 Brown & Sharpe Universal Grinders.
- 1—No. 1, 2 and 3 Woods Univ. Tool and Cutter Grinders, complete (new).
- 2—No. 1 Grand Rapids Universal Grinders (new).
- 1—CZT Grand Rapids Drill Grinder; capacity $\frac{1}{2} \times 2\frac{1}{2}$ drills (new).
- 1—6x32" and 14x72" Norton Grinder.
- 1—No. 10 and 11 Plain Brown & Sharpe.

Millers

- 1—No. 3 LeBlond Plain, d. b. g., 3-step cone, heavy duty.
- 1—No. 3 Cincinnati, d. b. g., 3-step cone type.
- 1—No. 12 Kearney & Trecker, plain, motor dr., with 5 h. p. 220-v., d.c. motor.
- 2—No. 12 American Plain Millers (new).
- 2—No. 2 Rockford Universal Millers (new).
- 2—No. 0 Bickett Vertical Profilers and Millers (new).

Lathes and Turrets

- 1—24" x 14' Thayer & Houghton (old style, but good).
- 1—Each new Sidney Heavy Duty 27", 25", 19", 17" and 15" swing, by 6', 8', 10' and 14' beds, all 3-step cone, d. b. g., q. c.
- 2—24" Gisholt Lathes, chucking equipment and taper attachment (modern).

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- 1—Each of 16, 20, 24" Ohio Crank Shapers, with vise and countershaft (new).
- 1—Each of 16, 18, 24" Hollingsworth b. g. crank, with vise and c. s. (new).

Drills—Radials and Multiples.

- 1—No. 30 Natco 34-spindle Multi., with No. 2 Morse taper shanks.
- 1—4' Full Universal Radial Drill.
- 2—24" Aurora, s. h., b. g., t. a., p. f., motor drive, with 2 h. p. 3-ph., 60-c. 220-v. motors.
- 2—21" Hoefer Stationary Head Drills.
- 2—24-28" Hoefer, s. h., b. g., p. f. drills.

Presses

- 1—No. 3-C Bliss straight side double crank.
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- 1—No. 3½ Toledo Inclinable.

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- 1—6" throat, B. & M., $\frac{1}{2}$ thru $\frac{1}{2}$ capacity.

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These machines are in A-1 condition.

Six $\frac{1}{4}$ Inch Automatic Screw Machines
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- 1-36" x 36" x 12' Gray Planer, 4 heads.
- 1-36" x 36" x 24' Pond Planer, double head.
- 1-37" American Vertical Boring Mill, 2 heads.
- 1-38" x 20' New Haven Engine Lathe, c. r.
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- 1-Heavy Beveling Shear, capacity $\frac{3}{4}$ " plate.
- 1-350 ton Niles Hydraulic Wheel Press, 84" capacity.

RADIAL DRILLS.

- 1-6' Niles plain, motor drive.
- 1-3 $\frac{1}{2}$ ' Bickford, g. b. drive.
- 1-Heavy duty Baker drill, g. b. drive, Style 2 M.

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- 1-3" P. & W., geared head.
- 5-2x24 J. & L., geared heads.
- 1-3x36 J. & L., geared heads.
- 1-2" x 24" Pratt & Whitney, grd. hds.
- 1-2" Cleveland automatic, 5 hole.
- 1-2 $\frac{1}{2}$ " Cleveland auto., Model A.
- 1-14" W. & S. Turret.
- 10-Hand screw machines.

MILLING MACHINES.

- 1-No. 0 Owen plain.
- 2-No. 4 Cincinnati plain.
- 3-No. 3 Cincinnati universal.
- 1-No. 11 $\frac{1}{2}$ Brainerd universal.
- 1-No. 3 Cin'ti plain, s. p. drive.
- 2-No. 4 Cincinnati vert., s. p. drive.
- 1-No. 2 B hvy. pl. B. & S., s. p. dr.
- 1-No. 1 Y Brown & Sharpe.
- 1-No. 10 Pratt & Whitney, hand.

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- 1-48" No. 4 Brown & Sharpe auto.
- 1-No. 13 B. & S. spur and bevel.
- 1-No. 6 Lees Bradner auto.
- 1-36" No. 4 Cincinnati auto.
- 1-36" Fellows Gear Shaper.
- 1-24" Schuchardt & Schutte.
- 1-Ingle Tooth Rounder.

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- 1-13" x 8" x 12" Curtis vert. dbl. cyl.
- 1-No. 0 Auto garage compressor.
- 1-12" x 10" Ingersoll-Rand.

ENGINE LATHES.

- 1-13" x 5' 6" Carroll-Jamison, s. q. c.
- 1-16" x 8' South Bend.
- 1-20" x 8' Morris.
- 1-16" x 8' Pratt & Whitney.
- 1-17" x 8' Greaves-Klusman.
- 1-14" x 6' Le Blond, quick change.
- 1-20" x 8' Lodge & Shipley, qck. ch.
- 1-20" x 10' American, d. b. g. tap. att.
- 1-36" x 12' Bradford standard.

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- 1-16" Queen City, b. g. crank.
- 1-18" Hollingsworth, b. g. crank.
- 1-20" Smith & Mills, b. g. crank.
- 1-24" Stockbridge, b. g. crank.

GRINDERS.

- 1-No. 70 Heald, internal.
- 1-10" x 24" Modern.
- 1-No. 2 $\frac{1}{2}$ Bath, universal.
- 1-10" x 50" Norton, plain.
- 4-10" x 30" Landis, plain.
- 2-6" x 48" Pratt & Whitney, plain.
- 1-12" x 32" Landis, plain.
- 1-12" x 24" Modern grinder.
- 1-10" x 24" Landis, plain.
- 2-6" x 32" Norton, plain.
- 1-14" P. & W. vert. surface grinder.

MULTIPLE DRILLS.

- 1-4-Spindle Barnes, 22", b. g. & p. t.
- 1-4-Spindle Barnes sensitive.
- 1-3-Spindle sen., Taylor & Fenn.
- 1-No. 4 32-spindle Fox.
- 1-2-Spindle Allen sensitive.
- 1-5-Spindle Detroit sen. horizontal.
- 6-24" Drills, single head.
- 2-30" Aurora, single head.
- 1-40" Cincinnati, tapping attach.

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from 1500 tons down to 18 tons,
large platens and small platens,
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Several Pumps belted and one steam driven.
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2 Air Compressors.
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Rack Driven Press, 40" stroke.
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1½, 2 and 3" Cleveland Automatic Screw Machines.

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Hendey 15" Friction, Vise and c. s.

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Brown & Sharpe No. 0, Six-Hole Turret.
Southworth No. 2 Hand, 1" capacity.

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Fitchburg 14"x5', compound rest.
American 20"x10', Taper Attachment.

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Cincinnati No. 2 Universal Back Geared Miller.
Whiton No. 14 Automatic Gear Cutter.
Prentice 8' Semi-Universal Radial Drill.

LYND-FARQUHAR COMPANY

"Machine-Tool Values"

Boston, Massachusetts

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This department is exclusively for the use of those desiring to secure contracts for anything in the line of foundry or machine work, including press work, dies, jigs, fixtures, gears, die castings, drop forgings, screw machine products, springs, bolts, nuts, rivets, etc. Advertisements are to be set with side headings as shown, and with such display as may be appropriate to the copy used. Rates: one-eighth page, per month, \$4.

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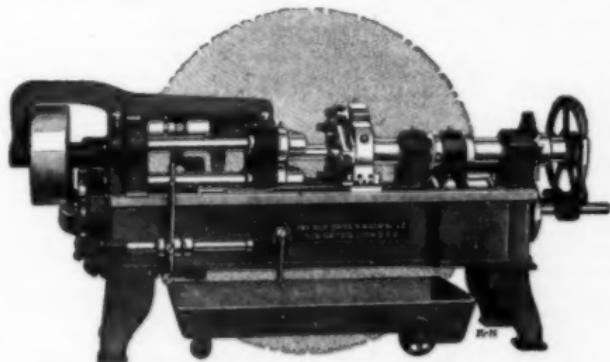
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Glad to submit guaranteed production estimate

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Automatic
Screw and Chucking
Machines



New Britain,
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U.S.A.

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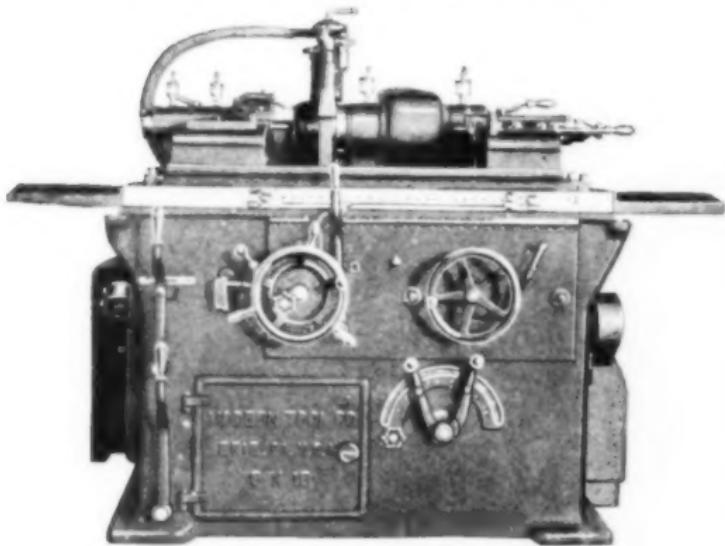
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